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BY R. G. HOGARTH, C.B.E., F.R.C.S. ENG.,
PRESIDENT OF THE BRITISH MEDICAL ASSOCIATION; SENIOR SURGEON, GENERAL HOSPITAL, NOTTINGHAM.

THE very name of Hospital Sunday reaffirms the intimate connexion between religion and medicine which is almost as old as history itself. The common link is faith. Religion without faith is unthinkable. Medicine without faith loses half its healing power.

### THE HEALING POWER OF FAITH.

Faith, therefore, is no new thing in medicine. It was once said: "He cures most in whom most have faith." The sufferer who casts his cares upon his doctor rids himself of a grievous handicap. Instead of obstructing the healing influence by his doubts and fears, he becomes submissive to it and may even quicken its work. Hope vanishes when faith is checked. But faith in what? The choice is wide. It may be faith in the bottle of medicine. It may be faith in the little pill. It may be faith in the healing efficiency of water, hot or cold. It may be faith in the well advertised virtues of a patent medicine. It may be faith in a saint, or faith in a system, or faith in a book, or faith in a revelation. It may be faith in a master to whose message the ears of thousands are attuned while millions hear it not. Or it may be—such are the wonders of faith—faith in some plain, humble doctor in a poor neighbourhood who for a generation has gone about his business—and the Master's—of healing, unknown beyond the short radius of his daily activities but within it respected, trusted, loved. Or lastly, it may be that faith in faith itself, best understood in the churches, where the injunction, "only believe," has exercised on quiet, receptive minds a soothing influence of healing, which passes the surface comprehension of the cynic, but not the deeper understanding of the wise.

And now, lest you should think that I am leading you down rather vague and misty paths, I will ask you as earnestly as I can for your active, positive faith in something which happily combines in itself many of the objects towards which faith is directed. I mean, of course, that great composite and complex institution, the general hospital.

If you must have personality in which to believe, you will find it there on the hospital and nursing staffs. If you crave the strengthening atmosphere of place, which on the religious side you expect in shrine or temple, where is it better found than in the hospital from whose doors so many have gone forth healed and rejoicing? We do not hang our trophies on our walls, for trophies harbour dust and dust is forbidden by the modern laws of health, but the records stand and are known, and the healed give us good report among their fellows. And if you desire, as who does not?—the comfort of hope to steady the shrinking of fear, from whose lips does it better proceed than from those of the doctor, who, subject himself to human infirmities, knows too much of pain to be niggardly of reasoned assurance and the salutary stimulus of measured encouragement?

### THE IDEAL HOSPITAL.

Perhaps you may think it strange if I go back 400 years for a definition of the ideal hospital. Yet where is there a better than Sir Thomas More's, who in his "Utopia" conceived the hospital of his ideal city state to be so well appointed that "though no man is sent thither against his will, there is no sick person in all the city that had not rather lie in the hospital than at home in his own house."

Consider what the hospitals were like when those words were written. They were the refuge of the destitute and the plague-stricken. At best they provided little more than a roof over the sick man's head and a mattress on which he might lie. Nursing there was none, and the medical art of the time was as often a hindrance as a help to recovery. Horrible contagions throve in the dark and reeking corners of the wards. The idea, therefore, of a hospital, worthy of its name as a Guest House where God's sick and poor are healed, and so garnished and equipped that even the rich would rather lie there than at home, may well have seemed preposterous to More's contemporaries. Even to-day it requires something of an effort to break away from current conceptions, still far too circumscribed, of the function and scope of a general hospital.

### THE GENERAL HOSPITAL.

So I invite you to conceive of your own general hospital here in Nottingham, as the hospital of the whole community in the wide area which it serves. Conceive it as the hospital, not of the poor alone, nor yet of the poor and the wide range of middle classes, but of all classes who are sick—all who care to use it, with no distinction of rich and poor. That is a new interpretation of the term—"General Hospital" and, with your permission, I will develop the idea. But I must guard against a dangerous misconception. I am not proposing to rob the poor of the least part of the birthright bequeathed to them by a long line of magnanimous benefactors. I say emphatically that, while you open the hospital door much wider to other classes, you must not close it one inch in the faces of the poor. The full freedom of the general hospital to the sick poor is the very origin and foundation of the voluntary system. For the poor, the healing given by the hospital must still be without money and without price. But why, if nothing but the best is good enough for the poor, should less than the best be offered to others? Thus, while still maintaining the most generous definition of the poor and their poverty, I would ask all the rest to contribute to the hospital in proportion to their means, with payments graded, not merely according to the total figure of the family income, but to the figure of its necessary expenditure, which, as you know, is usually a wholly different thing.

### PAYMENT FOR HOSPITAL TREATMENT.

No new principle is here involved. Payment for hospital treatment is already much more widespread than is commonly supposed. A recent official report has shown that 171 provincial hospitals, of which 27 are large institutions, make some provision to meet what is well described as the insistent demand for paying beds. The methods adopted vary widely. In some the payment is still disguised under the form of a thank-offering. Patients are told exactly what the cost of their maintenance has been and then they are invited to give as generously as they can. I will only observe that no Chancellor of the Exchequer would dream of applying such a system to the Income Tax unless he was prepared for a gigantic deficit. In the hospitals it produces a useful but quite inadequate amount.

You will remember the poignant question in the New Testament, when, after the healing of the ten lepers, only one returned to give thanks—"But where are the nine?" I will not say that gratitude in the hospitals is expressed in the same unsatisfactory proportion. But you can well understand what happens. A patient who would cheerfully pay £100 to be cured when the pain is sharp upon him, begins to think, as soon as the pain is gone, that perhaps he never was quite as bad as he feared, that Nature unaided might have healed him had he but left the cure to her, that £100 is a lot of money, that others are much better able to pay than he, that hospitals,

after all, were designed to be free, and that if only they were run on business lines the expenses could certainly be cut down. And the result of all this hard thinking (and there is plenty of time to think in a hospital bed) is that if he gives £5 it is really all that he can afford. The plain moral, I take it, is that there should be a definite contract between hospital and patient as to what the patient shall pay.

### A GREAT AMERICAN PAYING HOSPITAL.

Let us see how they arrange these matters in some of the American hospitals. Take that of Detroit, Michigan, where Mr. Henry Ford has his famous motor works. You will not be surprised to hear that Mr. Ford and his family have built and equipped a magnificent hospital with a School of Nursing and Hygiene attached. The hospital has 600 beds and an out-patient department with a daily average of 300 patients. It is on a similar scale, in other words, to the Nottingham General Hospital. The Ford family have spent 10 million dollars on the land, buildings and equipment, and they met the deficit on each year's working till the institution was complete. They have shown, as you will agree, a princely spirit of generosity. Now, waiving all claim to interest, they expect the patients who receive treatment to pay sufficient to cover current expenses. The room charges for board and nursing service vary from 4½ to 8 dollars a day, according to whether the patient shares a room with others or has a private room with bath. In addition, he pays from 21 to 70 dollars a week for the professional services of physician or surgeon according to the nature of his case, and there are other charges for X ray or radium treatment and for special nursing if required. Even the out-patient department makes a first visit charge of 5 dollars for the routine physical examination and 5 dollars for the routine laboratory examination, and other charges are made at subsequent visits, according to treatment.

So it is clear that the Ford Hospital at Detroit is specially designed for the patient who can pay, and if the charges seem to us rather high, allowance must be made for the high wages and salaries of the United States, while if interest had to be paid on capital expenditure, the charges would be much higher still. One half of the beds, 300 out of 600, are of the more expensive kind, with baths attached, at 8 dollars or 32*s*. a day, with a minimum professional charge of £4 and a maximum charge of £12 a week.

We have no hospitals like that in this country. Yet what a boon they would be to the middle classes, as offering a much needed alternative to the nursing home, which is an indispensable institution in our present system, but one which will, in my belief, eventually disappear when the transitional period is over, and the paying hospital system is fully developed. For even the best of nursing homes are subject to the grave disability that they are run for profit. The City of Detroit, of course, has a general hospital as well, where free treatment is offered to the poor; but the distinguishing feature of the Ford Hospital is that it is a full size hospital, equipped on the very latest lines, advertising its attractions to the sick public just as a first-class hotel might do, the crucial difference being that it is expected to return no other dividend than the improving health of its guests. The Bishop of Durham some time ago complained of the modern millionaire's lack of cultural imagination, even when obeying his benevolent impulses. This Ford Hospital is an effective answer to that charge, and I hope it may find many imitators.

### THE MIXED HOSPITAL.

If you do not altogether like the idea of a hospital run for paying patients only, though not run for profit, consider the scores of hospitals in the United States, in Canada, and others in this country too, where free and paying patients are found together under the same roof. The Liverpool Royal Infirmary has had five paying single wards since 1887. It displays the right principle; but fancy five paying beds for the whole of Liverpool! At Brighton there are 14 private rooms, at Colchester 12, and so on. The scale is utterly and grotesquely inadequate. In America the hospital exists as much for the paying as for the free patient. There you find part-paying patients and whole-paying patients, and those who pay for extra comforts and extra privacy according to a fixed tariff; nor is the fact concealed that such profit as is made on the paying patients is utilised for meeting the deficit on the free wards. The richer patients help to carry the poorer; which surely is just as it should be. They share all the incomparable advantages of a great hospital, which money cannot buy outside, and they are glad to help the poorer sufferers in the adjoining wards. Such a system is conceived in the true spirit of human fellowship in suffering, and, believe me, differences of class count for very little amid the stark realities of the operating table or in the hospital ward.

In my view we are ripe in this country for a rapid development of this system of mixed hospitals with paying and non-paying wards, or, if it is preferred, for a system of twin-hospitals—the one for free and the other for paying patients. The choice may often be determined by the possibilities of structural alterations on the existing hospital sites. Moreover, hospital experts now favour the view that a maximum of 600 beds is quite enough—or more than enough—for any general hospital, and that the model hospital of the future may be a large central building for urgent cases, with a ring of branch pavilions on the outskirts of the city, to which cases may be cleared as soon as they can be moved. The motor car has made changes possible which 20 years ago would have been quite out of the question.

### THE VOLUNTARY SYSTEM JUDGED BY RESULTS.

You will say, "What about finance?" I reply that such hospitals as I have described can be financed as our existing hospitals are financed—namely, by the voluntary subscriber. But he must be organised as never before. It must be brought home to every man and woman that if it is their misfortune to become hospital cases their place is in the hospital. When once people realise that when they are gravely ill their chance of making rapid recovery is immeasurably greater in the hospital ward, they will not withold their support. Given a liberal supply of paying wards, their subscriptions, when in health, will be sure, and in time of trouble they will gladly pay the tariff charged. We have to make the hospital to that extent a business proposition, just as at present the nursing home is a business proposition. But it will not be run for private profit, and that, I repeat, makes the all essential difference.

May I remind you, in connexion with this problem of finance, that the provincial hospitals, as was shown by the last report of the Joint Council of the Order of St. John and the British Red Cross Society, are now doing remarkably well. Seventy-five per cent. of 750 hospitals had a credit balance of their maintenance accounts for 1925, and their invested funds showed an increase of six millions in the last five years.

It is not a failing or a decaying system which can produce results like those. Remember, too, that 90 per cent. of the current expenditure is subscribed voluntarily, and only 10 per cent. is derived from public funds in return for services, which the State or the public authorities could not render half so cheaply, even if they could do it as well. Let us get rid of the erroneous idea that the provincial hospitals live from hand to mouth under the threat of an ever-impending bankruptcy. It is not true. They were, indeed, in a parlous financial state after four years of war, during which they had most brilliantly justified their title to popular confidence and support. But that nightmare has passed away, and whenever you have a capable board of management, you find the local general hospital facing the future with a cheerful serenity. The problem of the great London

hospitals, which have special difficulties of their own, must not be confounded with the problem in the provinces.

And what is the secret of this happy transformation? It is due mainly to the development of various contributory schemes into which, unfortunately, I have no time to enter, to better the organisation of workmen's contributions through their voluntary levies, and to the Hospital Savings Association and to the spread of the popular Hospital Saturday and Hospital Sunday movements. Not many years ago the bequests of the rich philanthropists and the annual subscriptions of the charitable were the mainstay of the hospitals. They are so no longer. It is not that rich benefactors give less, but that thousands of workmen now contribute their weekly pence. We have had many superb individual gifts in Nottingham, but the penny beats the pound every time when it rolls in by the million, and in the large provincial hospitals the income derived from the various kinds of contributory schemes is now double that of any of the four principal items of income. In our own county, for example, the contributions of the miners alone amounted in 1925 to £9530. Last year's returns will show, I fear, a serious falling off owing to the long stoppage in the industry, but I am confident that the Nottingham Hospital has no permanent source of income more assured and stable than that of the miners' levy.

Believe me, the key word of the future is still voluntary contribution, which to my ear has a nobler and more humane sound than either tax or rate. It involves, I know, continuous effort on the part of a large band of voluntary workers. But though hospital workers may grumble at times and wonder why they go on, when others selfishly do nothing, they have their reward, which they deeply treasure in their hearts, though they may not often speak of it aloud. In a rather disillusioned world unselfish enthusiasm may become increasingly difficult to kindle. But the voluntary hospital, always advancing, sure of its goal, producing immediate as well as distant results, cheerful amidst suffering, mending the broken, restoring the rhythm of life to the sick, helpful always and invariably sympathetic, has never lacked good and loyal friends to champion its cause. Nor will it lack them in the days to come.

It is not unlikely that the friends of the voluntary hospitals have an anxious time before them in the near future in connexion with the approaching reform of the Poor-laws and the substitution of new public health committees of town and county councils for the existing boards of guardians. It looks as though the voluntary hospitals may be invited—happily there is no suggestion of compulsion—to place themselves under the direction of these public health committees, which would naturally take over control of the Poor-law infirmaries, and to receive in return additional grants of public money. Until the actual scheme is produced it would ill become me to pass judgment in advance, but I am bound to say that the implications are a little alarming, so far as the independence of the voluntary hospitals is concerned, and the utmost vigilance and caution will be required. The freedom of the hospitals is their very life; from their freedom springs the joyous spirit which pervades them and the enthusiasm which their cause inspires.

Just one more point as to the future of our Nottingham Hospital. It lacks, to my mind, one thing above all for its completion, and that is a medical school and teaching staff. We have, as you know, an infant University, whose buildings are rising grandly above the old meadows of the Trent. We have still to kindle among our people a proper civic and intellectual pride in that inspiriting foundation. I look forward to the day when Nottingham University will possess amid its other faculties a Faculty of Medicine, and then it will need a medical school at the general hospital. Do not, I beg you, consider this a matter of academic interest only. It is not so. Every large general hospital should have its medical school attached. No hospital fulfils its largest purpose unless it teaches as well as heals. Nothing contributes more powerfully towards keeping the resident and consultant staff of a hospital up to the highest mark of efficiency than the critical eyes of a band of eager students, quick to observe the failures as well as the successes of their instructors, and for ever comparing, contrasting, and asking the why and the wherefore. Doctors, like other people, give their best when most on their mettle. I must not enlarge on this theme on the present occasion, but I beg of you to consider it as a problem of real importance alike to Nottingham University and to the Nottingham General Hospital.

I ask you to believe, and to believe whole-hearted, in the future of your general hospital. Have faith in it, for it deserves your trust. There is no one on its staff, in whatever capacity, who does not give the best that he or she has to give. I ask you to work for its steady development along the safe, sure lines which have carried it to its present eminence, and to widen its sphere so that it may become a centre for the diffusion of medical and surgical science as well as a temple of healing. Above all, let us be content with nothing but the very best for the welfare of all our people, and for the fame of the city and the county to which we are proud to belong.

# An Address
ON THE
# PENDING CHANGES IN THE ADMINISTRATION OF VACCINATION.

*Delivered before the Annual General Meeting of the Association of Public Vaccinators of England and Wales on Jan. 28th*

BY JAMES BENNETT, M.R.C.S. ENG., D.P.H., J.P.,
RETIRING PRESIDENT OF THE ASSOCIATION.

PROBABLY no Bill of our time, not even excepting those dealing with Education and National Insurance, has envisaged or encompassed so many possibilities as the suggested Poor-law Reform Bill; and in some form or other it seems certain ere long to become law.

The Rating and Valuation Bill has been passed and is now in operation. By eliminating assessment it was probably an essential preliminary to the greater Bill to follow, the necessity being to meet the day-to-day financial needs of the nation as fulfilled by its rates. The Government having almost noiselessly eliminated assessment is not likely to yield to the clamour of prejudiced or conservative people who have failed to notice costly overlapping in the present administration of the health services, one of which is vaccination. Changes in the control of such services are among the chief objects of the Bill, and so far as vaccination is concerned they are thought by many to be long overdue. The suggested alterations in its administration, so far as we can yet ascertain, may not be numerous but are exceedingly important to the public vaccinator. His position has always been too insecure, and this has probably militated against such open advocacy of the case for vaccination as there might have been had the fear of "creating enemies in council" been less real.

## VACCINATION AND THE POOR-LAW.

Vaccination is a purely preventive measure and has never been regarded as curative. Why, then, has it for nearly a century been controlled by a body which, so far as health goes, is otherwise solely concerned with cure—in spite of the fact that at the same time we have health authorities at one time entirely, and still mainly, concerned with prevention? We must go back to the beginning of Poor-law and

health work to find the reason for this anomaly, which is, in fact, purely accidental.

In 1834 the Poor-law Amendment Act was passed, and four years later came the Registration Act (Births, Marriages and Deaths) and the appointment of Poor-law officers. At this time vaccination had survived the criticism of its earliest antagonists and scoffers. Jenner had received the thanks of the nation in words and in cash, and had been honoured in many foreign countries; the evidence that small-pox could easily be prevented was obvious, and people who could afford to pay were asking for vaccination. It is little wonder, therefore, that at this time the Poor-law Commissioners gave authority for Poor-law medical officers to vaccinate the poor at the public expense (1840); for not until 1848 was the first Public Health Act passed, and in 1840 the only local authorities which covered the whole country were those now known to us as boards of guardians. Having taken up this wonderful discovery of Jenner's they administered it with such success that in 1854 so-called "compulsory vaccination" became law—not, however, being enforced till after the devastating pandemic of small-pox in 1871-72. Vaccination had been handled so well by the boards of guardians that it does not seem to have occurred to anyone that in the great Public Health Act of 1875 it should be transferred to the public health authorities. With the introduction of the Infectious Diseases (Notification) Act of 1889, the change-over might conveniently have been made; but vaccination remains what it was at first, the only part of the boards of guardians' work which is concerned with the prevention of disease.

The relationship between public vaccinators and their boards have, with few exceptions, been very cordial, and little criticism of the boards has been needed on this score. The actions, however, of many boards for a number of years on the general question of vaccination may be severely criticised, for they are actions from which the country is now suffering severely by the recrudescence of preventable small-pox.

### CONTROL BY COUNTY COUNCILS AND BOROUGHS.

It is suggested that county boroughs and county councils should take up the reins of vaccination, and this is, indeed, believed to be the essence of the change in the administration of vaccination contemplated in the new Bill.

So far as the public vaccinator is concerned the machine runs so smoothly—and, according to reports from the Government Lymph Establishment, so successfully—that no single nut or bolt seems to need changing. The working machinery of vaccination is all right, but the "order" department of vaccination is too often lacking in vim. As regards the traveller for vaccination—the vaccination officer—it would often seem that the slacker he is the better pleased are the guardians. Vaccination therefore flags. Would it be different under health committees? I think it would, for such committees have the preservation of health, rather than the relief of poverty and sickness, as their main plank, and there would at least be one medical man associated with them to stand by vaccination and the public vaccinator.

To get the right perspective it should be helpful to look at the matter from the point of view of the medical officer of health. As to the views of the county M.O.H. I cannot speak, but on the views of the urban and rural M.O.H. I am, perhaps, in a privileged position, as I am public vaccinator to a county borough and a rural (county) area and M.O.H. to two urban and one rural district.

As a district M.O.H. I should be heartily glad, on small-pox breaking out, to be in a position to call up assistance for vaccination directly through the county M.O.H., thus avoiding the delay inevitably involved in getting into touch with the clerk to the guardians in order that he in turn may communicate with the public vaccinator. If it is found essential to open vaccination stations the delay is added to by the fact that the clerk must (at the worst) wait for a meeting of his board, or (at the best) of a subcommittee of that board, in order to obtain sanction for opening these stations. The Vaccination Order of 1917 empowers medical officers of health to vaccinate immediate small-pox contacts in case of emergency, but does not go so far as to empower them to vaccinate the numerous other people who request immediate vaccination or revaccination. That is the work of the public vaccinator. Delays would be enormously lessened if all that was necessary was a message to the county M.O.H., who would already have been given executive powers by his council for cases of emergency.

### OBJECTIONS TO THE TRANSFER.

There are several questions, however, which it is necessary to study before willingly committing ourselves to transference to other control. First, will the power of the vaccination officer be in any way diminished or will he be given encouragement—instead of the too frequent discouragement—to utilise the powers already nominally vested in him? Secondly, will the placing of control in the hands of county boroughs and county councils mean that vaccination will eventually drift into the hands of assistant medical officers of health?

It is almost impossible for greater powers to be granted to the vaccination officer, seeing that at present he is expected to prosecute all who fail to arrange for the vaccination of children for whom they are responsible, and have not otherwise protected themselves in law. This the vaccination officer can do without obtaining the sanction of his board in any particular case.

But how often nowadays is a prosecution instituted? Seldom or never. Largely by the opposition of ill-informed or only partly informed guardians the vaccination officer is discouraged from taking any action. Could he more adequately fulfil his duties if he were under a county or borough council? I am of opinion that he could, for such councils—and perhaps more particularly county councils—would not be swayed by biased opinions in the same way that members of boards of guardians may be.

To turn to the second question, if it were likely that vaccination would drift entirely into the hands of assistant medical officers of health it would be a most serious thing, not only for the public vaccinator, but for the whole cause of vaccination. In this eventuality the public vaccinator, as a separate entity—except in sparsely populated rural and in some cases urban areas—would be wiped out, and the cause of vaccination would suffer greatly from the fact that frequent changes of the assistant medical officers of health would prevent that good feeling between parents and the vaccinator which can only be developed by the passage of time, and by which the public vaccinator comes to be regarded in the same light, for this particular purpose, as is the regular medical attendant. The fact that this homely atmosphere is absolutely essential to the smooth working of vaccination would surely be apparent, at any rate to the county borough M.O.H., who advises his committee. As the change is not likely to be made in county areas, owing to the fact that assistant medical officers ordinarily live too far away from the homes of the people to be of any service, it does not seem likely that vaccination can ever drift into the hands of any other than practitioners residing in or near their appointed areas as at present.

### SUMMARY.

I have endeavoured to put the case both for and against the proposal to remove vaccination from the control of boards of guardians and make it over into the hands of county boroughs and county councils. It would apparently be to the advantage of the public vaccinator if such a transfer were made, and the change would probably be welcomed by all district medical officers of health, and, in my opinion—though this remains to be seen—by all county medical officers of health.

# BLACKWATER FEVER IN LONDON.

## A CRITICAL STUDY.

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To the medical practitioner unfamiliar with the more dramatic diseases of the tropics, it may be a matter of comment that such an essentially tropical condition as blackwater fever may occur not uncommonly in England in those who have recently resided in endemic areas of this disease. It therefore occurred to us that an analysis of some fourteen cases of blackwater, which have developed in London, and which have been studied during the last seven years, might reveal certain important aspects of the ætiology of this mysterious disease. Though the admirable recent work of J. G. Thomson [1] has cleared up many hitherto unappreciated aspects of blackwater fever, it is generally admitted that there are many obscure points which still require elucidation.

All the cases in this series have come from that notorious home of blackwater fever—the dark continent of Africa, especially the West Coast, where the subtertian form of malaria predominates (Macfie and Ingram).[2] All our cases occurred in Europeans of pure descent.

The distribution of cases in our series is as follows: Nigeria (N. & S.), 6; Gold Coast, 3; Belgian Congo, 2; Kenya Colony, 2; N. Rhodesia, 1; total, 14 cases.

The length of residence in the endemic area has been already dealt with by Stephens [3] and Thomson; the latter has pointed out that the chances of developing it are in direct relation to the length of time during which the individual has been exposed to the infection. In our series the length of stay in the endemic area was stated in 11 cases, and varied from one to five years, the average time being 3·2 years.

The next point investigated was the length of time which had elapsed from the time of the patients' arrival in England to the onset of blackwater fever. In one case it developed on the day of arrival, but in no case did blackwater occur after *ten weeks'* residence, the average time being four weeks. The moral to be drawn from this would seem to be that patients suffering from subtertian malaria should be observed with great care during the first three months subsequent to their return to the English climate; only by this means can the danger of blackwater fever be averted. To put it shortly, the reacclimatisation period is the period of danger. We have been unable to elicit any factor of importance in the previous medical history of these cases, save that antecedent syphilis seems to play no part, as has been suggested in the rather analogous instance of paroxysmal hæmoglobinuria. The Wassermann reaction was performed in five instances before the onset of blackwater with negative results. A previous alcoholic history plays little or no part as a precipitating factor, and in one case only of our series was there a definite history of alcoholic excess. This case was fatal.

With regard to the sex distribution, 10 of the cases were males and four females. Considering the relative proportions of the sexes in the tropics, especially in Africa, this would indicate about an equal susceptibility of the sexes.

No age appears to be exempt from blackwater, those of our cases ranging from 3½ to 62 years. The subjoined table shows the incidence in different decades:—

| Age. | Cases. | Age. | Cases. |
|---|---|---|---|
| Under 20 | 1 | 40–50 | 2 |
| 20–30 | 7 | 50–60 | 0 |
| 30–40 | 3 | 60–70 | 1 |

The case of 3½ years, although not the youngest on record, is probably the youngest recorded in this country, and therefore is sufficiently juvenile to be of interest. The mortality of blackwater in our series was exactly 50 per cent; this compares unfavourably with the average of 23·5 per cent. worked out by Thomson in over 1000 cases in Rhodesia. Half of our deaths occurred in adults in the prime of life and in the third decade.

According to our figures, blackwater fever can occur in susceptible subjects in this country at almost any month of the year.

The incidence was as follows: January, 1 case; February, 1; March, 2; April, 1; May, 1; July, 1; August, 3; September, 1; November, 3. No cases in June, October, or December. There appears, therefore, to be no predilection for any particular time of the year.

In two instances there was a definite history of previous attacks of hæmoglobinuria. In one there were two attacks within the last four years, and to the third, during which he came under our notice, he succumbed. A second case had suffered from an attack two years previously and he recovered. In another fatal case it is noteworthy that three brothers of the same family all fell victims to the same disease.

The relationship of hæmoglobinuria to malaria was carefully investigated, and our findings are in entire agreement with those of Thomson. We have divided our evidence into three headings:—

(*a*) *Endemic area.*—In every case the patient came from an area which has been abundantly proved to be an endemic focus of subtertian malaria.

(*b*) *Clinical history of subtertian malaria* was present in every case; that is to say, low fever accompanied by bilious vomiting and general malaise, and that general subicteric tinge of the skin and sclerotics which stamps the malarial cachectic. The dyspeptic symptoms may so dominate the clinical picture that, as in one of our cases, a tentative diagnosis of gastric ulcer had been made.

(*c*) *Parasite findings.*—Subtertian malaria parasite in the ring stage were demonstrated in 50 per cent. of the cases. Crescents were found only once. Considering that many of these cases of blackwater came under observation only after hæmoglobinuria had commenced, this is by no means a low proportion. Thomson has pointed out the rapidity with which these malaria parasites disappear from the peripheral blood. The following table correlates the parasite findings with the day of the disease:—

| Before onset of blackwater. | | | | After onset of blackwater. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Day of disease. | Cases exam. | St. P. | Pa. A. | Day of disease. | Cases exam. | St. P. | Pa. A. | Day of disease. | Cases exam. | St. P. | Pa. A. |
| 11 | 1 | 1 | — | 1 | 6 | 2 | 4 | 4 | 2 | — | 2 |
| 2 | 2 | 1 | 1 | 2 | 7 | 1 | 6 | 6 | 1 | — | 1 |
| 1 | 3 | 2 | 1 | 3 | 2 | — | 2 | 8 | 1 | 1 | — |

St. P. = Subtertian present. Pa. A. = Parasites absent.

This table clearly shows that, although in the majority of cases the parasites are wholly destroyed with the onset of blackwater, and frequently with the result that the infection is extirpated, this is not necessarily always so. In one case in which no parasites could be demonstrated on admission to hospital, a scanty infection of subtertian rings was found on the eighth day, after the urine had become clear for about six days. In other words, a relapse of malaria had taken place during convalescence.

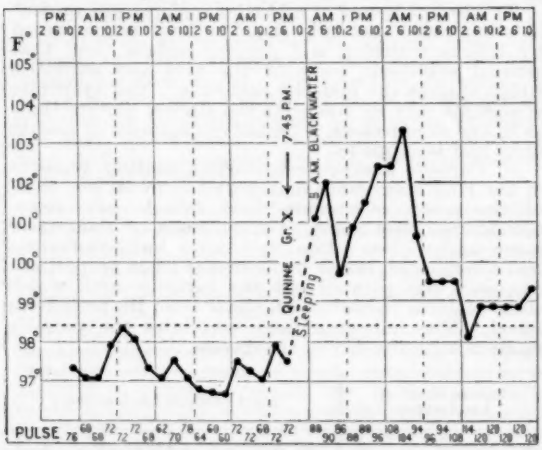
### *Quinine in Blackwater Fever.*

In its more recent aspects the relationship of quinine to blackwater fever has been studied most accurately by Thomson. This observer has stated that he has never seen a single case of blackwater

in a person who had taken 5 gr. of prophylactic quinine daily. We are unable to substantiate this statement in its entirety. For we have accurate histories of two cases who faithfully took 5 gr. of quinine daily during their stay in Africa and also during the voyage to England. Another case (the brother of a doctor practising in Africa) had regularly taken prophylactic quinine, according to Koch's week-end system (i.e., gr. xv. on Saturdays and Sundays with sodium sulph.), and the child which we record, aged 3½ years, had been given 2 gr. of quinine daily since leaving the endemic area and during her stay of two months in England.

*Effect of Quinine in Precipitating the Attack.*—Anyone who has studied this subject admits the difficulty in determining the exact rôle played by quinine in precipitating the actual attack. We consider it indisputable from general evidence that blackwater can occur when quinine has not been exhibited; but in our particular series it is difficult to escape the conclusion that this drug is a potent factor in precipitating the crisis. In all cases, save one, quinine had been given in some form or other just prior to the attack, and not always in massive doses (from 5 to 28 gr. daily). We will content ourselves with quoting one striking case:—

A lady was invalided from Nigeria with symptoms of vomiting and dyspepsia, on which a diagnosis of gastric ulcer was based. Accordingly she was admitted to a nursing home for X ray investigation of the intestinal tract. On examination it was noted that the spleen was enlarged and she had an icteric tinge, and it was considered obvious that the gastro-intestinal symptoms were attributable




to subtertian malaria. No parasites were found in the blood. After being in bed for four days with normal temperature the patient was given at 7.45 P.M. 10 gr. of quinine, after which she spent a comfortable night until 2 A.M. when she woke up vomiting bile-stained fluid. At 5 A.M. she had a rigor with a temperature of 101° F. and passed blackwater; by 10 A.M. she was deeply jaundiced. From a perusal of attached chart it is difficult to escape the inference that quinine precipitated this attack of blackwater.

*Other Precipitating Factors.*

Naturally one considers the effect of chill—as in the analogous condition of paroxysmal hæmoglobinuria in which it is so well recognised. In one case the onset was distinctly traceable to a thorough drenching while fishing. One of our lady patients developed blackwater at the theatre at 11 P.M., and we have another curious instance of a patient who, after 10 days' treatment in bed with full doses of quinine developed blackwater the morning following the first day out of doors. In this case one is naturally suspicious of a chill having been the deciding factor.

*Clinical Aspects.*

In six cases of this series we have observed a condition which one may term the "pre-blackwater fever state." In three out of six seen before the onset the probability of blackwater supervening was definitely aroused in one's mind and the patient warned accordingly. The following is a summary of the typical pre-blackwater symptoms: low fever, nausea and vomiting, anæmia, persistent headache, constipation, general malaise, sometimes rigors. The spleen is enlarged and painful, and sometimes the liver as well. The urine before the attack shows a trace of albumin and urobilin. It should be emphasised, however, that in some cases no pre-blackwater condition can be recognised. The attack comes like a bolt from the blue as in the case of the lady already quoted in detail; a similar history was obtainable in other cases.

*Subjective Symptoms observed in Blackwater Fever.*—In 13 cases the onset was with a rigor. In every case pyrexia was noted, varying greatly in height and persistency. It was noted that the pyrexia frequently outlasted the hæmoglobinuria. The pyrexia and rigors do not seem to be due to the effect of malaria parasites as few or none of these organisms can be demonstrated, and the temperature is entirely unaffected by quinine. Undoubtedly these symptoms are attributable to the sudden liberation of the products of hæmolysis. Bayliss has shown that hæmoglobin itself is not a toxic body, and the symptoms can be attributed to the stroma of the disintegrated blood corpuscles acting as a foreign protein. The globin, when in a free state, is, moreover, also a toxic body and may play some part. In other words, the symptoms are due to a form of protein shock.

*Pulse.*—We should like to make the observation which appears to us to be new that, on the whole, the pulse-rate is slow in proportion to the temperature.

*Jaundice* is more obvious in these cases which were destined to be fatal, but was noted in all.

*Bilious vomiting*, always a marked feature of the disease, was noted in 11 cases.

*Abdominal pain*, due to tenderness over the liver and spleen, was frequently noted as was also loin pain, especially in the early stages.

*Signs of Bad Prognosis.*—Hiccough which was noted in two fatal cases, jactitation noted in three fatal cases, and mental phenomena, such as delirium and extreme restlessness and insomnia, not affected by big doses of ordinary hypnotics, are all of serious import. Delirium is common in severe cases. We content ourselves with one remarkable example:—

This patient remained more or less delirious until the sixth day when in the evening he suddenly became maniacal, got out of bed, seized two bottles of medicine, struck at the sister and, seizing hold of the nurse, tried to throw her downstairs. He then locked the door and drank the contents of the two bottles. After one hour he was induced to unlock the door and was found lying on the bed exhausted and the pulse uncountable. Death appeared imminent. He slept for one hour and was delirious all night. His hæmoglobin percentage at this stage was 10. During the next few days he gradually got stronger and the mental condition slowly improved. There was a recurrence of vomiting, and jaundice deepened temporarily. The jaundice persisted until one month from onset of blackwater and normal mentality was not reached till about the same time. Eventually the patient left quite recovered.

This case illustrates the fact that, although no case of blackwater fever, however slight, is too trivial to worry about, no case is too severe to despair of.

*Physical Signs.*

*The Spleen.*—Attention was paid to the condition of the spleen in 12 cases. In each it was enlarged and tender, usually reaching to the umbilicus. In one case where no statement was made, both liver and spleen were found enlarged post mortem. In five cases the observation was made that, after the onset, the spleen decreased markedly in size, and by the sixth day was only just palpable. In one case it was not palpable at all on the fourth day. The liver was enlarged and tender in six cases, usually two fingers-breadth below the costal margin.

*Gall-bladder.*—A distended gall-bladder could, in one case, be palpated with ease during the acute attacks.

### *Urine.*

*Observations on Urine before Onset of Blackwater.*—Minute observations of the urine were made only in two cases before the onset of blackwater. In one the only abnormality detected was a trace of albumin two hours before the onset of blackwater. In the other cases, one day before the urine was quite normal, and the next morning—i.e., six hours before the onset of blackwater—urobilin and urobilinogen were present; albumin and a few granular casts were also noted.

*Time of onset* of blackwater was, as a rule, in the early morning, about 2 A.M.

*Duration of Hæmoglobinuria.*—This varies considerably. In cases which either recovered, or died after hæmoglobinuria had ceased, the shortest time was 24 hours and the longest four days. The average duration was 2·8 days. In one case the urine cleared after two days, remained clear for two days, and was again pink for 24 hours.

*Suppression of Urine in Blackwater Fever.*—It is usually stated that the gravest danger to be apprehended in blackwater fever is suppression of urine. In our series of cases suppression was not a marked feature. One case had absolute suppression for 30 hours, but recovered entirely from the urinary condition, only to die later of pneumonia. Another fulminating case passed only 2 oz. of urine in the 24 hours before death, but the fatal issue was due more to the profound anæmia than to the suppression. In at least six cases *polyuria* was noted, both during the hæmoglobinuria and in some cases afterwards. Amounts up to 124 oz. in the 24 hours were noted. In no case had we any reason to suspect that permanent kidney damage resulted. The results of spectroscopic examination of the urine are recorded in five cases. In two there was oxyhæmoglobin only; in one case methæmoglobin only and in two cases both pigments were present. In future, in order to see whether the nature of the pigments bears out the work of Baker and Dodds, more accurate observation on the reaction of urine in the different stages of blackwater will have to be made, and the results correlated with the pigment findings. Bile, as has been frequently stated in text-books, was never found in the urine.

### *Examination of the Blood.*

The observations on the blood are in agreement with those of other observers. Before the blackwater attacks the blood picture is that of a severe case of subtertian malaria. The greatest destruction of red blood corpuscles with ultimate recovery of the patient was a young man, in whom the red cells dropped to under one million and the hæmoglobin was at one time 10 per cent. A simple clinical observation regarding the presence of hæmoglobinæmia has been made in several cases. At the commencement of hæmoglobinuria, it will be found that the percentage of hæmoglobin is relatively high in comparison with the number of red cells. For instance, one case on the second day had 2,300,0000 red cells and 70 per cent. hæmoglobin—a colour-index of 1·5; five days later the red cells were 2,500,000 and the hæmoglobin percentage 40—a colour-index of 0·8. We suggest that the high percentage of hæmoglobin in the first instance is explained by the presence of free hæmoglobin in the serum. The number of subtertian parasites present in the peripheral blood varied greatly in different cases as has already been observed. In one only that was a fatal case were they extremely numerous. A count revealed 1590 subtertian rings per c.mm. of blood some 12 hours before the advent of hæmoglobinuria.

*Modes of Death.*—We have already mentioned that none of our cases died of suppression. One died of septic parotitis following blackwater, one of acute cardiac failure, four of acute hæmolysis, and one of pneumonia. Those who died of acute hæmolysis were cases of blackwater of a fulminating character, and death supervened in two within 14 hours of onset.

### *Treatment.*

*Treatment of Patient in Pre-blackwater Stage.*—The essential difficulty which the physician experiences when confronted with a severe case of subtertian malaria is, on the one hand, the necessity of energetic treatment of the malarial infection, sometimes in order to save the patient's life; on the other hand, the ever-present danger of precipitating blackwater fever. In effect he is "between the devil of subtertian malaria and the deep, dark sea of blackwater fever."

We do not intend to discuss the minor points of treatment, but to lay down some broad principles.

(1) If, as has been shown, quinine in subtertian malaria induces hæmolysis, it is reasonable to suppose that the smaller the quantity of quinine administered, the less will be the subsequent hæmolysis. Thus, there is every reason for commencing the specific treatment of subtertian malaria cases with small and repeated doses of quinine such as 1 gr. at four-hourly intervals, and gradually increasing as tolerance is established.

(2) Every precaution should be taken against chill.

(3) As both clinical and experimental work goes to prove that suppression of urine is much less likely to occur if the urine is alkaline, massive doses of potassium citrate either alone, or together with sodium bicarbonate, should be given until the urine is alkaline. In most cases oral administration will suffice.

As a rule, in blackwater fever the urine is strongly acid, so that massive doses (it may be given in doses of 1 drachm at four-hourly intervals) are required to overcome the acidity. We do not suggest that this will necessarily stay off the onset of blackwater fever, but that it will guard against the possibility of suppression. Incidentally, it is claimed by Sinton[5] that the efficacy of quinine is enhanced by the simultaneous exhibition of alkali.

*Treatment of Patient during Hæmoglobinuria.*—(1) If the urine is not made alkaline, as above, intravenous injections of sodium bicarbonate (gr. 150 to 1 pint of distilled water) should be administered without delay. We have employed the same technique as Hanschell.[6] We consider that this is a more rational procedure than the massive injection of normal saline hitherto practised. It is not advisable ever to inject more than one pint of fluid at a time owing to the very real danger of œdema of the lungs.

(2) Regarding the administration of quinine when once blackwater has commenced, we are of the opinion from a study of the cases in our series, as well as from a study of the literature, that there is no evidence that the continued administration of quinine has any appreciable effect on the course of the disease. It certainly does not prolong the hæmoglobinuria. On the other hand, in most cases there is no indication for the exhibition of the drug as malarial parasites are usually absent after the onset.

(3) The obvious remedy that comes to one's mind in a case of severe hæmolysis is transfusion of blood from a suitable donor. There has been considerable hesitation in the past about adopting this procedure, because of the not unnatural fear of causing further hæmolysis with resulting suppression. In a recent moribund case in whom the urine had cleared, but who was suffering from extreme anæmia (the blood count showing only 850,000 red cells per c.mm.) blood transfusion of 700 c.cm. of blood was performed, with the result that the patient revived in a miraculous manner and regained consciousness. There was no evidence of any further hæmolysis, and the urine remained clear. Unfortunately the improvement was not maintained and, in spite of a further transfusion, the patient died three days later.

Although a fatal issue ensued in this unfortunate case, we consider the results very encouraging, and have every intention of repeating it should a further occasion arise.

*Theory of the Genesis of Blackwater Fever based upon a Study of these Cases Correlated with Recent Biochemical Knowledge.*

In subtertian malaria hæmolysis occurs with each attack of fever, and in cases of "low fever," when, as so often happens, patients deny they are really ill, a chronic hæmolysis must in effect be taking place.

The evidence for this is based on a consideration of the following facts:—

(1) A progressive anæmia, as shown by blood counts and hæmoglobin estimations, which in subtertian infections may proceed to an extreme degree and resemble Addisonian anæmia; it is just in these cases, as one of us (P. H. M.-B.)[7] has pointed out, that the parasites of subtertian malaria can be demonstrated only with great difficulty.

(2) Indirect positive van den Bergh reactions. Neave Kingsbury [8] has recently shown that in 99 per cent. of cases of subtertian malaria the serum bilirubin is above the normal figure, which is taken as 0·5 units.

(3) Urobilin is found in the urine in pathological amounts in 92 per cent. of cases of subtertian malaria.

(4) Excess of bile is excreted leading to bilious vomiting, which characrerises "bilious remittent fever." Normally the reticulo-endothelial system of the body is able to deal with the products of hæmolysis in the following manner:—

The hæmoglobin is split up into: (1) hæmatin (the iron-containing part); (2) globin (the iron-free protein part).

Hæmatin is not commonly found in the blood or tissues, but some observers state that they have found it in the blood in malaria; and Brown,[9] finding that solutions of hæmatin cause chills and fevers, suggests this pigment may at least be partially responsible for the symptoms of malaria.

It is generally maintained that hæmatin is gradually split up by the reticulo-endothelial system into: (1) an iron-free pigment hæmatoidin, or bilirubin; (2) iron-containing pigment, hæmosiderin.

The bilirubin is excreted by the liver, resulting in an increased flow of bile. The liver is so busy dealing with bilirubin that it is unable to deal with the urobilin, which is absorbed from the intestine, and therefore appears in the urine. At the same time the amount of bilirubin in the blood is increased. As long as the liver is functioning well, no bile will appear in the urine, because the renal threshold for bilirubin stands normally at four units; in fact, the threshold in hæmolytic jaundice is even higher, it being possible to have between 5 and 18 units present in the serum, without the appearance of bile in the urine. This is the probable explanation of the discoloured skin and lemon-tinted sclerotics which characterise subtertian malaria.

The hæmosiderin is deposited as brown or yellowish-brown granules in the liver, spleen, bone-marrow, and kidney. From these sites it is later taken up to be utilised in the formation of new red blood corpuscles.

The very plausible suggestion, put forward by Kingsbury, is that the enlargement of the spleen in malaria is due to the hypertrophy of the reticulo-endothelial system, in order to cope with the big demands on the system in dealing with the products of hæmolysis. The extent of hæmolysis, as measured by the serum bilirubin and urinary urobilin, goes hand in hand with the size of the spleen. At the onset of blackwater fever, a condition in which the hæmolysis is profound, the spleen is usually very large indeed and tender, as we have pointed out.

In the majority of cases of subtertian malaria probably little or no free hæmoglobin appears in the serum. But in a more severe infection, where a greater degree of hæmolysis occurs, the reticulo-endothelial system cannot deal immediately with all the products of hæmolysis, and a certain degree of hæmoglobinæmia must result.

Now, although there is hæmoglobinæmia, there is not *hæmoglobinuria*, because the kidney has a definite threshold for hæmoglobin, just as it has for sugar urea, &c., and until it reaches a certain concentration in the serum it will not be excreted by the kidney as hæmoglobin. According to Pearce,[10] before the kidney will excrete hæmoglobin the blood must contain at one time more than 0·06 g. of free hæmoglobin per kilo of body-weight. It is also stated by Sellards and Minot [11] that at least 17 c.cm. of *laked corpuscles* are necessary in order to produce hæmoglobinuria in man. So it is possible to have a condition of hæmoglobinæmia without hæmoglobinuria, and doubtless this often occurs.

If the hæmolysis is still more profound, then, in spite of the fact that the reticulo-endothelial system is working at its fullest capacity, some of the hæmoglobin is, as it were, "spilled over" the kidney threshold, and hæmoglobinuria, or blackwater fever results. It is more a question of the rapidity of hæmolysis than of degree—i.e., the red count may fall from five million to one million without hæmoglobinuria, provided that it does so at such a rate that the reticulo-endothelial system is able to deal with it. A *sudden* hæmolysis of a much smaller degree, on the other hand, may temporarily overtax the powers of the reticulo-endothelial system and result in hæmoglobinuria.

It is important to realise that, even when the hæmoglobinuria occurs, most of the hæmoglobin is broken up by the usual mechanism and only a relatively small proportion, 17 to 36 per cent., is excreted in the urine. It therefore follows that, as is observed clinically, there is deep hæmolytic jaundice, increased excretion of bile, and the appearance of urobilin in the urine, and very obvious enlargement of the spleen.

The hæmoglobin is in solution in the serum and can be demonstrated there (Thomson), but, as also was proved in one of our cases, for a short period only.

According to Baker and Dodds,[12] what happens now depends on two factors: (1) the reaction of the urine, (2) the concentration of sodium chloride. If the reaction of the urine is above pH 6 the hæmoglobin will be excreted in the form of oxyhæmoglobin, the urine will be red and clear, and no suppression will result.

If the reaction be below pH 6 and there be 1 per cent. or more of sodium chloride present, brown pigment will be precipitated in the tubules. The hæmoglobin passes through Bowman's membrane in dilute transudate, the reaction of which is in region of that of the blood. When the tubules are reached, reabsorption and concentration take place, together with an increase in the acidity of the urine. The hæmoglobin is then precipitated—probably as hæmatin—with the result that the tubules are liable to become occluded, and renal function is impaired. The urine is brown, and shows the spectrum of methæmoglobin, and there is a dense deposit. The deposit seems to contain hæmatin.

This explains how suppression is brought about. It should be borne in mind, however, that the kidney has considerable powers of getting rid of the plugs in the tubules, as witnessed by the masses of casts found in all blackwater urines.

It is noted that during blackwater fever the spleen, which at the onset is big, rapidly decreases in size, so that by the sixth to eighth day it is frequently only just palpable. The explanation of this would seem to lie in the fact, demonstrated by Barcroft [13] in animals, that any condition in which oxyhæmoglobin is removed from the circulation, the spleen contracts down even to one-sixth of its original size.

The crux of the question in blackwater fever is, as Sir Patrick Manson used to say, "What pulls the trigger"? We consider that it is now firmly established that blackwater fever in man is found only in association with the subtertian parasite, and that reports of its association with the benign tertian parasite under natural conditions rest on slender foundation, and are probably explained by the occurrence of a double infection. In these double infections, as has been pointed out by Thomson, the subtertian parasites

tend to disappear at the onset of blackwater, while the benign tertian forms are still demonstrable in the blood. The significance of this observation is obvious. Two instances, quoted by Schilling and Jossman and Rudolf, in therapeutic malaria of hæmoglobinuria following *P. vivax* infection, are possibly merely instances of paroxysmal hæmoglobinuria in syphilitic subjects.

Now it will be remembered that the subtertian parasite undergoes an entirely different cycle of development in the human body from the benign tertian and quartan. In the former schizogony proceeds, not in the corpuscles of the peripheral blood, but in the capillaries of the internal organs, notably the spleen. We submit that, in persons who are going to develop blackwater fever, a great proliferation of the subtertian parasites is proceeding within the spleen pulp, and the spleen itself is engorged and tender. The number of parasites found in the peripheral blood cannot therefore be taken as a real index of the number of parasites in the spleen and liver; in other words, these organs form the home of the subtertian parasite.

Hæmolysis normally occurs within the spleen pulp and the capillaries of the internal organs, and coincides with the full development of schizogony of the subtertian parasite. This schizogony usually occurs very irregularly. Although there is no proof of its occurrence, it is possible that in blackwater fever full development of schizogony of a very large number of parasites might be attained at the same moment. The hæmolysis in the spleen would then be extreme, and the amount of free malarial hæmolytic toxin liberated proportionately great. The absorption of this sudden massive dose of malarial toxin into the general circulation then leads to general hæmolysis, the resources of the reticuloendothelial system are overtaxed, and hæmoglobinuria results.

The rôle of quinine in the production of blackwater is obscure, but we suggest two possible ways in which it may act:—

(1) Neave Kingsbury has shown that the administration of quinine in subtertian malaria is followed always by an increase in the serum bilirubin, which begins one hour after administration and continues for 24 hours. This means to say that quinine causes definite hæmolysis of the infected red cells, and, as suggested by the same worker, this increased hæmolysis might be just sufficient to precipitate the onset of blackwater—i.e., the last straw which breaks the camel's back.

(2) Although the reduction in the size of the spleen in malaria after quinine therapy is to be ascribed to direct destruction of the parasite, there is considerable evidence that quinine can cause contraction of the spleen by a specific action on the non-striped muscle of that organ (Cushny[16]). Its action on the uterus is well recognised. A sudden contraction of a heavily infected spleen, even if only of very short duration, would force a very large amount of hæmolytic toxin into the general circulation, and might thus cause a profound hæmolysis.

Further work on the functions of the spleen and the effect on them of drugs, cold, exercise, &c., may throw some light on the production of blackwater fever.

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(*Continued at foot of next column.*)

# DIVERTICULITIS.*

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DIVERTICULA of the large intestine may be congenital (or true) and acquired (or false).

Garnett Wright in 1920 recorded a case of congenital diverticulum of the pelvic colon and quoted cases of Lockwood, Black, Bierhaven (quoted by Meckel), and Hedinger. These diverticula are characterised by having present in their walls all the coats of the large gut—mucosa, submucosa, muscularis, and serosa—and the opening into the bowel is usually large. It is a very rare condition, for in 10,167 consecutive post-mortem examinations (at the London Hospital) not one case was observed.

*Acquired Diverticula: Pathology.*

Acquired diverticula of the large intestine may be found in any part of it. The commonest site is the pelvic colon, whilst above the splenic flexure and in the rectum they are relatively much less frequent. Diverticula of the large intestine were present in 218 out of 10,167 consecutive post-mortem examinations—i.e., 2·14 per cent.—but of these 10,167 post-mortem cases, 55 per cent. were less than 30 years of age, 24 per cent. were between 30 and 50, and 21 per cent. were over 50. In the great majority of the 218 cases the pelvic colon was the part affected, but diverticula were found in every part of the large gut, including the rectum. It was interesting to note how frequently diverticula of the pelvic colon ceased suddenly at the rectosigmoidal junction. They were usually multiple, sometimes numbering hundreds, but occasionally only one was present. They varied in size from that of a grape to a grape seed.

They were essentially hernial protrusions of the mucosa and submucosa through the circular muscle at those sites of perforation of the latter by vessels where subserous fat was present. (This was first observed by Klebs.) These perforating vessels occur at certain definite places: (*a*) the mesocolic attachment, and (*b*) between the mesocolic tænia coli and the lateral tænia. According to Hamilton Drummond, however, diverticula are prevented from passing directly into the mesocolon by the presence of the strong mesocolic tænia, so that those, following perforating vessels, appear primarily between the mesocolon and the lateral tænia. Then they commonly enter the appendices epiploicæ (which lie immediately behind the lateral tænia and contain fat continuous with the retroperitoneal fat), because the fat in them offers less resistance to enlargement than does the serosa (Bland-Sutton), or pass backwards along the vessels between the serosa and the circular muscle, sometimes to lie in the mesosigmoid (Hamilton Drummond). Occasionally diverticula appear at the antimesocolic border, and then they are not usually associated with any vessels.

* This paper is based on a study of 218 post-mortem examples of diverticula and diverticulitis, and 52 clinical cases of diverticulitis at the London Hospital.

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The wall of the diverticulum was composed of mucosa, submucosa, and serosa, and in the cases in which it had entered an epiploic appendix there was a quantity of fat beneath the serosa, and it was very easy to overlook the presence of the diverticulum. In the present series a prolongation of muscle was sometimes seen in the wall of the diverticulum, but never at the apex. Fæcal material was generally present in the diverticula, in one of which was a foreign body. As a result of the inadequate muscle coat, combined with the fact that the opening into the bowel is usually minute and always much smaller than the lumen of the diverticulum, fæcal material is unable to re-enter the bowel. Absorption of fluid takes place, resulting in inspissation and the formation of a fæcal concretion or stercolith, containing cholesterol and calcium carbonate. Pressure on the musosa, combined with the inevitably present micro-organisms, results in inflammation—i.e., diverticulitis. Rarely this ends in resolution, but very much more commonly in fibrosis, suppuration, or gangrene. Apart from being an end-result of inflammation, gangrene may also result from vascular thrombosis. Perforation of the diverticulum not infrequently occurred, leading to abscess formation or general peritonitis. It is interesting to note in this connexion that a careful post-mortem examination of cases of diverticulitis with general peritonitis usually revealed the same sequence of events—first the formation of a pericolic abscess, and second the rupture of this abscess into the general peritoneal cavity.

In the absence of perforation bacteria may penetrate the diverticular walls and give rise to abscess formation or general peritonitis, but much more frequently to chronic localised peritonitis and peridiverticulitis. As a result of chronic localised peritonitis the pelvic colon tends to become adherent to surrounding structures, especially the bladder, small intestine, uterus, and its appendages, and the parietes, in that order of frequency. If perforation occur now a fistula will be formed between the pelvic colon and the adherent viscus. This bi-mucous fistula was vesicocolic in four cases and rectocolic in one. No case of vesicocolic fistula has yet been reported in a female, apparently on account of the intervention of the uterus and its appendages. In two cases adhesions to the small intestine produced intestinal obstruction, and this may also be caused by kinking in consequence of chronic mesosigmoiditis. It may be well to recall here that if the pedicles of an abnormally mobile omega loop are approximated by chronic inflammation of the mesosigmoid volvulus is likely to occur. Intestinal obstruction may result from chronic localised peritonitis in yet another way—an inflamed diverticulum in an appendix epiploica becomes adherent, forming a band which strangulates a loop of small intestine.

Abscess formation is more frequent than general peritonitis, the reason being that by the time perforation or penetration occurs protective adhesions have usually formed, thereby limiting the suppurative process. In 52 cases of diverticulitis there were 11 abscesses clinically diagnosable as such, but the majority of the cases of general peritonitis were found to have resulted from rupture of pericolic abscesses, bringing the total number of abscesses up to 17. The abscesses are often small and may remain more or less latent, but not infrequently they burst into the bladder, giving rise to a vesicocolic fistula, or into the rectum or colon discharging themselves, or into the small intestine or through the skin. They may track upwards between the mesentery and the descending colon or along the outer side of the latter and form left anterior subphrenic abscesses, or they may form in the retroperitoneal tissue, surround the left kidney, and point in the loin. Occasionally they enter the psoas sheath, within which presumably they might spread upwards, producing subphrenic abscess and empyema, or downwards pointing in the thigh. Sometimes a diverticulum in an appendix epiploica is found in a hernial sac (usually left-sided femoral), and may give rise to an abscess therein. Pelvirectal abscess may have its origin in pericolic or perirectal suppuration, the result of diverticulitis.

Peridiverticulitis is a condition characterised by enormous thickening of the bowel wall, so that it may measure as much as 1 inch from mucosa to serosa. As contraction of the fibrous tissue occurs stenosis of the lumen results, producing intestinal obstruction in varying degree. In a typical case the macroscopic appearance was as follows. The peritoneal coat was thickened and adherent to surrounding structures. There was an increase in the amount of subserous fatty tissue, especially in the appendices epiploicæ. The bowel wall was greatly thickened and intersected by small abscesses and sinuses and contained diverticula in various stages of inflammation, often containing fæcal concretions. Generally the mucosal surface was smooth, ulceration being absent, but when a stricture was present the mucous membrane above it was sometimes ulcerated. A stricture resulting from peridiverticulitis was usually tubular. The adjacent lymphatic glands were frequently enlarged. Microscopically the mass was found to consist of dense fibrous tissue with areas of small round-celled infiltration, whilst in other places evidence of more acute inflammation was to be found; abscesses and diverticula in varying degrees of inflammation were seen.

As one would expect in the case of long-standing chronic inflammation, carcinoma may supervene. How frequently this happens is very difficult to say, but in the Mayo Clinic 7 cases out of 27 are reported, and Gant records two cases, whilst Hochenegg, Telling, Roberts, and others have also reported cases. In none of the present series was there evidence of the supervention of carcinoma. For the recognition of diverticula in a carcinoma Wilson advises the use of a fine glass probe, with which the fresh mucosal surface of the carcinoma is carefully examined. Any area in which the probe enters the bowel wall is treated by horizontal sectioning, diverticula present being thus demonstrated. Portal pyæmia with abscesses of liver may complicate diverticulitis; such a case was recorded by Whyte, whilst Foggie reported a case of systemic pyæmia, in which embolic abscesses of the lungs and brain resulted from a similar cause. In the present series fat necrosis was observed in the pelvic mesocolon in one case of death from general peritonitis following perforation of a diverticulum. A similar condition occurred in Roberts's case.

*Ætiology.*

*Age-incidence of Diverticula in the 218 Post-mortem Cases.*

| Years. | 10–19 | 20–29 | 30–39 | 40–49 | 50–59 | 60–69 | 70–79 | 80–89 | Totals |
|---|---|---|---|---|---|---|---|---|---|
| Males.. | 1 | 0 | 2 | 16 | 33 | 50 | 23 | 10 | 135 |
| Females | 0 | 0 | 5 | 9 | 23 | 26 | 18 | 2 | 83 |
| Totals | 1 | 0 | 7 | 25 | 56 | 76 | 41 | 12 | 218 |

The youngest patient was aged 12, the oldest aged 86. (Ashurst reported the case of a patient aged 7, the condition being verified by operation, whilst Hartwell and Cecil's case was a patient aged 6.)

In the 218 cases inflammation was present in only 5.

*Age-incidence of the 52 Clinical Cases of Diverticulitis.*

| Years. | 20–29 | 30–39 | 40–49 | 50–59 | 60–69 | 70–79 |
|---|---|---|---|---|---|---|
| No. of cases | 3 | 5 | 15 | 10 | 15 | 4 |

Males were more frequently affected than females—35 out of 52 cases. The youngest patient was aged 23, the oldest aged 77. About half the cases were definitely obese, a small percentage thin and wasted, whilst about a quarter of the patients alleged a recent loss of weight. A history of chronic constipation was obtainable from the majority, but by no means all. How important a factor constipation is in the production of diverticula is difficult to say, for against it must be considered the important and well-established

fact that diverticula are more common in men and constipation is more prevalent among women.

The actual cause of diverticula formation is unknown, but the following theories may be mentioned:—

(*a*) Graser's: periodic mesenteric congestion.
(*b*) Sudsuki's: loss of perivascular fat.
(*c*) Keith's: sacculation of the large gut combined with irregular tonic contraction of the circular muscle resulted in the forcing out of diverticula at weak points.
(*d*) Congenital weakness of unstriated muscular tissue throughout the body resulting under certain circumstances in the formation of diverticula. In support of this it is interesting to note that in the 218 cases of diverticula found post mortem 24, or 11 per cent., were accompanied by diverticula in other hollow viscera. In 9 cases there was a similar condition of the small intestine, in 9 of the bladder, in 5 of the œsophagus, and in 1 of the œsophagus and bladder. Hamilton Drummond in 500 post-mortem examinations found 22 cases of diverticula. In 4 of these there was a similar condition of the small intestine, and in 1 of the bladder—i.e., 23 per cent.—were accompanied by diverticula in other organs.
(*e*) Still others regard the condition as a simple atrophic manifestation. Constipation is the first event, the bowel hypertrophying in an attempt at compensation. When hypertrophy has reached its limit it is succeeded by atrophy and diverticulation.

If diverticula were the result of increased intracolonic pressure only, then one might have expected to find them with some frequency above strictures. This was exceptional. On the other hand, it must be remembered that most colonic strictures (excluding diverticular) are carcinomatous, and therefore the condition may not be long enough in existence to allow the formation of diverticula.

Whichever explanation is the correct one, the two essential factors are the same presumably as in all other herniæ: (*a*) weakness, congenital or acquired, of the bowel wall; (*b*) increased intracolonic pressure, whether it be due to obstruction to the onward passage of fæces or to constipation, excessive gas formation, &c.

### *Signs and Symptoms.*

The clinical features of *acute diverticulitis* have been well described as those of acute appendicitis in the left iliac fossa. They included the usual general constitutional disturbance with elevation of temperature, pulse-rate, &c., and pain, tenderness and rigidity in the left iliac fossa with or without the presence of a lump. Sometimes these signs and symptoms were in the hypogastrium or right iliac fossa. There were seven cases of acute diverticulitis (13–14 per cent.), in the majority of which a diverticulum had perforated.

*Abscess.*—There were 11 cases of abscess (21 per cent.); 4 were in the left iliac fossa, 1 in the left loin, 3 in Douglas's pouch, 1 in the right iliac fossa, and 2 in the right lumbar region.

*General peritonitis* occurred in 12 cases (24 per cent.), in 3 of which it complicated acute intestinal obstruction.

*Intestinal obstruction* was generally chronic with occasional subacute attacks. Now and then the condition became acute (three cases, 6–7 per cent.). There were 16 cases (30 per cent.) of chronic obstruction, seven of which were associated with a palpable tumour. A certain number gave a history of recurrent attacks of acute diverticulitis.

*Vesicocolic fistula* was present in four cases (8 per cent.). The patients complained of the passage of flatus and sometimes fæcal material per urethram and usually of painful and frequent micturition. Excluding these four cases urinary symptoms occurred in 7 patients, in one of whom the main trouble was dysuria. Another suffered from hæmaturia, his urine containing pus and *Bacilli coli*. Another developed a vesicocolic fistula later. One case somewhat simulated a gynæcological condition and one was discovered accidentally.

*Tumour* was present in 23 cases, 14 in the left iliac fossa, 4 in the hypogastrium, 2 were felt per rectum only, 1 in the right iliac fossa, and 2 in the right lumbar region. In the majority of these cases the swelling was due to peridiverticulitis, but almost as many were abscesses. The typical tumour, so frequently present in the left iliac fossa, was somewhat sausage-shaped, tender, irregular, hard, deeply situated, and fixed. It had a distinct tendency to vary in size. This was very characteristic. Apparently it was due in some cases to absorption of pus or escape of the latter through a fistula and in others to subsidence of inflammation in one part of the tumour, being followed later by an inflammatory exacerbation in another. Again it was not infrequently observed that the tumour diminished markedly in size after the emptying of the bowel by an enema; in such cases fæcal impaction was doubtless the main factor in the variation.

*Toxæmia* produced a moderate elevation of temperature and pulse-rate, and occasionally in more severe cases marked loss of weight and strength resulted. Somewhat characteristic was an intermittent pyrexia, the temperature not usually rising above 101° F.

*Leucocytosis* was frequent.

*Bowels.*—Constipation was present in the majority, occasionally alternated with diarrhœa. In eight cases blood was passed per anum. The bleeding in four of these was hæmorrhoidal in origin, in one very probably diverticular, whilst in the remaining three its exact source was not determined. Three patients were troubled with tenesmus. Pus was passed per anum by one patient whose pelvic abscess burst into the rectum.

Although clinical groupings are useful, it must be understood that they frequently overlap—e.g., general peritonitis may occur in a patient who gives a history of previous attacks of acute diverticulitis and chronic obstruction, whilst chronic obstruction is frequently associated with recurrent attacks of acute diverticulitis, &c.

### *Diagnosis.*

Diverticulitis must be considered a definite possibility in all patients over the age of 30 who have inflammatory trouble in the left iliac fossa, signs and symptoms suggesting carcinoma of the colon, vesicocolic fistula, or general peritonitis of unknown origin. It has to be diagnosed from:—

*Carcinoma.*—Diverticulitis may simulate carcinoma very closely and sometimes a differential diagnosis is impossible, but the following points will prove helpful in deciding between the two conditions: 1. Long history of chronic constipation with attacks of abdominal pain in the left iliac fossa. 2. Periodic febrile attacks. 3. Persistent absence of blood from the stools (macroscopic). 4. Patients usually fat and general condition good. 5. Varying size of tumour, but generally large and fixed. 6. Leucocytosis.

These six points are in favour of diverticulitis. In addition the presence of a vesicocolic fistula, which results much more frequently from diverticulitis than from carcinoma, would suggest the former. The suggestion could be confirmed by *cystoscopy*. In a case of diverticulitis there will be an area of inflammation generally most marked on the posterior wall of the bladder high up with pus coming through from time to time. If the case be one of carcinoma growth will be visible.

*Sigmoidoscopy* is not usually helpful on account of the difficulty of passing the instrument sufficiently high up. If the lower end of a smooth stricture be seen and a tumour be felt immediately above, the evidence is in favour of the inflammatory condition. Another point also in favour is said to be the absence of blood from the higher part of the bowel inspected. It is usually quite impossible to see the openings of the diverticula.

*X ray examination* is often conclusive. The diverticula are best seen after the barium enema has been evacuated, the bowel then being empty, but the diverticula retaining their barium for days. Sometimes a long irregular tunnel stricture is seen and is characteristic.

*Hyperplastic Tuberculosis.*—This usually presents no great difficulty in diagnosis and is more likely to be confused with cancer of the cæcum than with anything else, whilst it so rarely affects the pelvic colon that it need hardly be considered seriously in the differential diagnosis.

*Actinomycosis* usually affects the right iliac fossa, but sometimes the pelvic colon is the part involved. There is a great tendency for it to spread to the surrounding structures, retroperitoneal tissues, and the abdominal wall. Sinuses form, the typical sulphur granules containing the ray fungus are present in the pus, and the patient wastes and goes rapidly downhill.

*Acute Appendicitis.*—The diagnosis of acute appendicitis was made four times. In three of the four cases the condition found at operation was diverticulitis of the cæcum and lower part of the ascending colon, whilst in another case the pelvic colon lay in the right iliac fossa, and the perforated diverticulum was ligated

and removed through the gridiron incision which had been made. In two cases the pain started in the umbilical region, and then localised in the right iliac fossa, and in one case was accompanied by hyperæsthesia. There was no previous history at all suggestive of diverticulitis, and correct diagnosis was apparently impossible.

*Gynæcological Syndrome.*—It is recognised that diverticulitis may mimic very closely certain gynæcological conditions—e.g., chronic salpingo-oöphoritis, carcinoma of the ovary, &c. Shoemaker has emphasised this very strongly, and a routine examination of the rectum and pelvic colon has been suggested by some in all cases of pelvic disease. In one case only of the present series was there any simulation of gynæcological disease. This patient had in Douglas's pouch a hard lump which was not attached to the uterus and was not accompanied by bowel symptoms, other than lifelong constipation. She was first examined in the gynæcological department, where it was suggested that she was suffering from carcinoma of the pelvic colon, but further investigation pointed to diverticulitis, which was the condition found at operation.

*Pericolitis and Sigmoiditis.*—Some years ago when diverticulitis was relatively unknown, these terms were popular diagnoses. But gradually diverticulitis has replaced them, just as appendicitis has replaced perityphlitis. It is probably correct to conclude that sigmoiditis or pericolitis can occur apart from diverticulitis, that these are very rare, and from the point of view of diagnosis in practical surgery need not be considered.

*Fibromatosis* of the colon has been described, and one very characteristic feature is enormous thickening of the submucosa. It apparently results from infection through an ulcer and is but a modification of the very rare non-diverticular sigmoiditis.

*Syphilis* very rarely involves the pelvic colon, but when it does the shorter history and possibly signs of previous syphilitic trouble and the Wassermann reaction amongst other things should make the diagnosis clear.

*General peritonitis* from other causes. If the patient be suffering from general peritonitis when first seen, other causes of that condition, such as appendicitis, perforated duodenal or gastric ulcer, should be excluded if possible. A consideration of the history and physical signs including mode of onset, type of patient, presence of a lump, and site of maximum tenderness and rigidity will often enable this to be done.

*Perinephric and subphrenic suppuration* occasionally result from diverticulitis, and have to be distinguished from that due to other causes by the history and physical signs.

### *Treatment.*

This will be considered under several headings.

*Acute Diverticulitis.*—When the diagnosis of diverticulitis is certain or probable the abdomen is opened by a left lower paramedian incision. If an inflamed diverticulum be found it should be removed; if perforated drainage is indicated. In some cases it is only possible to close a perforation by over-sewing or covering with omentum, whilst in yet other cases, including those in which general peritonitis has resulted from rupture of a pericolic abscess, suprapubic drainage is all that is possible. It is to be remembered that these patients are often poor subjects for operation and desperately ill, and therefore the minimum that is necessary to give the patient a chance should be done as quickly as possible. *Abscess:* This should be opened and drained in the usual way.

*Vesicocolic Fistula.*—Laparotomy is performed and careful examination made to determine, if possible, the cause of the fistula. Any manipulation must be undertaken with extreme care to prevent the opening up of a pericolic abscess, rupture of a diverticulum, or injury to the gut. Preliminary cystoscopy and the history and physical signs will have proved helpful in excluding carcinoma. Transverse colostomy is performed. As a rule the gut need not be opened until the third or fourth day. The vesical fistula usually closes in a few weeks, and excision of the affected portion of the bowel with any necessary repair of the bladder may be undertaken in about one year's time. This two-stage operation greatly diminishes the risk of general peritonitis.

*Intestinal Obstruction.*—The treatment for this condition is colostomy. In certain acute cases with marked dilatation of the cæcum and small intestine a temporary valvular cæcostomy may be necessary in addition. At operation it is also very essential to decided if possible whether the condition be diverticular or carcinomatous. The character of the tumour must be considered, then the condition of the glands, peritoneum, and liver. It is sometimes absolutely impossible to decide between carcinoma and diverticulitis macroscopically, and this is undoubtedly the explanation of the disappearance of certain alleged carcinomatous tumours after colostomy. In view of this, if the tumour be not definitely carcinomatous a piece may sometimes be removed carefully for microscopic examination and the wound closed by suturing, over-sewing, or an omental graft. Excision of the affected portion of gut is always inadvisable in the presence of obstruction.

Radical treatment, if not contra-indicated by the age and condition of the patient nor by too extensive involvement of the bowel, &c., may be carried out one year later, and will consist in excision of the affected portion of the gut with end-to-end union or permanent colostomy according to the amount removed. These remarks apply to obstruction of the large bowel at the affected site. Small gut obstruction is treated along the usual lines, whether due to strangulation by an adherent epiploic appendix acting as a band, or due to kinking of a loop of intestine which has become adherent to the inflamed mass. If in the latter case the adhesions be very dense, a lateral anastomosis between the afferent and efferent loops may be indicated.

*Diverticula Discovered Accidentally during Screening, and causing no Physical Signs nor Symptoms.*—Provided that these patients can be supervised periodically to enable the progress of the case to be watched, they may be treated medically, the essentials being thorough daily evacuation of the bowels procured if necessary by the use of mild aperients and laxatives (liquid paraffin excellent).

### *Prognosis.*

This will depend on the condition of the patient when first seen.

*General Peritonitis.*—This is a very grave complication. Two out of nine patients recovered; one of the remaining seven would have done likewise, but died from pulmonary embolism on the twelfth day.

*Abscess.*—This is a much less serious condition. 9 out of 11 recovered and 2 died from general peritonitis (not included in the above).

*Acute Diverticulitis.*—The prognosis in these cases, if treated by operation, is good. Seven cases were submitted to operation and all recovered.

*Intestinal Obstruction.*—In *acute* obstruction the outlook is bad. These patients have sometimes suffered previously from attacks of subacute obstruction and recovered with medical treatment, so that there is a tendency for the serious nature of their present condition to be overlooked too long before receiving surgical treatment. Another danger to which they are exposed is the forcible injection of enemata, which at times has caused the rupture of a diverticulum and general peritonitis. Of the three cases of acute obstruction in the present series all had general peritonitis. One died just after admission to hospital before an operation could be performed, and the other two, who were about moribund before, died shortly after operation. In one case there was a strong smell of turpentine in the peritoneal fluid, and a ruptured diverticulum had apparently resulted from the forcible injection of a turpentine enema.

*Chronic.*—If colostomy be performed well above the tumour and excision, when not contra-indicated,

be carried out about one year later, the prognosis is good other things being equal. Of five cases treated by partial colectomy four recovered and one died. This case, however, included a plastic operation on the bladder and is that reported below under vesicocolic fistula.

*Vesicocolic Fistula.*—Colostomy, well above the fistula, renders the immediate prognosis very good and greatly improves the patient's chance in a radical operation later. Three of the four cases have been treated by preliminary colostomy, the vesical fistula has closed, and further treatment will be carried out one year after the first operation. The fourth died from general peritonitis two to three weeks after a radical operation had been performed without a preliminary colostomy. Spontaneous cure has been reported, but must be very rare. In cases that are accidentally discovered and are not giving rise to much trouble careful medical treatment will suffice.

I am indebted to the Director of the Pathological Institute at the London Hospital for much helpful advice, and to those surgeons of the London Hospital under whose care were many of the patients.

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# THE DICK TEST

## AND ACTIVE IMMUNISATION AGAINST SCARLET FEVER.

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IN an endeavour to estimate the reliability of the Dick test, and the value of active immunisation of susceptible individuals against scarlet fever, the nursing staff of an infectious diseases hospital, to the wards of which are admitted annually from 1500 to 2000 odd cases of the disease, affords a particularly favourable field. Here we have a group of young adults, of necessity in intimate daily contact with cases of scarlet fever in the most highly infective stage of the disease. The degree of infectivity is reflected to some extent in the fact that during the past six years 70 nurses in this hospital have contracted scarlet fever whilst on duty.

### *Preparation of Toxin.*

The toxic filtrate used in the early part of the work, both for testing and immunisation, was obtained from a culture of the specific hæmolytic streptococcus isolated from the throat of a scarlet fever patient in this hospital. For testing purposes the filtrate was diluted to 1 in 1000 with normal saline. We have to thank Prof. T. J. Mackie, of the Bacteriology Department of the University of Edinburgh, for this preparation of toxin.

The development of scarlet fever in two nurses who had given negative Dick readings with the above test toxin, led us to try a more potent preparation. This latter toxin (X48) was kindly supplied by Dr. R. A. O'Brien of Messrs. Burroughs and Wellcome. A dilution of 1 in 1000 was employed for

(*Bibliography: Continued from previous column.*)


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### *Congenital Diverticula of Large Intestine.*


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the test. We are also indebted to Dr. O'Brien for a supply of immunising toxin (X79). The comparative toxicity of a 1 in 1000 dilution of the two filtrates, which we shall name the Edinburgh and London toxins respectively, is indicated by the Dick test results set forth in Table I.

TABLE I.—*Dick Test Results Obtained with the Edinburgh and London Test Toxins.*

| Source of toxin. | In 50 scarlet fever cases. | | | | In 71 cases other than scarlet.* | |
|---|---|---|---|---|---|---|
| | 1st to 3rd day of disease. | | 14th to 33rd day of disease. | | Dick pos. | Dick neg. |
| | Dick pos. | Dick neg. | Dick pos. | Dick neg. | | |
| Edinburgh | 49 | 1 | 14 | 36 (72%) | 27 (38%) | 44 |
| London (X18, B1962) | 50 | 0 | 24 | 26 (52%) | 42 (59%) | 29 |

* 55 cases from 1 to 10 years of age. 10 cases previous history scarlet. All neg. Edin., 2 pos. Lond.

The London filtrate was apparently of higher toxin content than the Edinburgh filtrate.

*Technique Employed.*

In applying the Dick test 0·2 c.cm. of a 1 in 1000 dilution of toxin was injected intracutaneously into the flexor aspect of the left forearm. As a control test 0·2 c.cm. of diluted toxin, previously boiled for two hours, was injected intracutaneously into the flexor aspect of the right forearm. Readings were noted at 8, 24, and 48 hour intervals after the application of the test. An area of erythema, 10 mm. or more in diameter, was read as positive, whilst a lesser area of erythema was noted as negative. Where areas of erythema appeared on both arms a study of their relative size, intensity, and duration led to the differentiation of negative-pseudo and positive-combined reactions.

The protective injections were administered subcutaneously about two inches above and behind the elbow, in alternate arms, at either 5-day or 14-day intervals.

*Dick Test Results in Nursing Staff.*

In Table II. we have the results of the Dick test applied to 187 members of the nursing staff.

TABLE II.—*Dick Test Results in Nursing Staff.*

| Age-period in years. | Total tested | Dick Neg. | Dick neg. pseudo | Dick pos. | Dick pos. pseudo | Dick pos. Per cent. | Pseudo reactions Per cent. |
|---|---|---|---|---|---|---|---|
| 18–20 | 99 | 62 | 9 | 25 | 3 | 28·3 | 12·1 |
| 20–25 | 78 | 47 | 10 | 19 | 2 | 26·9 | 15·4 |
| 25 and above | 10 | 3 | 4 | 2 | 1 | — | — |
| Totals | 187 | 112 | 23 | 46 | 6 | 27·8 | 15·5 |

The susceptibility of members of the staff to diphtheria, as indicated by 65 per cent. of positive Schick readings, apparently far exceeds their liability to contract scarlet fever. The lower susceptibility rate to scarlet fever, as compared with diphtheria, may, in part, be explained by the much higher percentage (35) of girls who gave a history of having suffered from scarlet fever previous to their entering hospital than from diphtheria (10).

Zingher [1] found that in groups of nurses and students 40 to 70 per cent. gave positive Dick as well as positive Schick reactions. On the other hand, his positive percentage for 981 individuals of a mixed population, in the 15- to 20-year age-group, was 16·8.

[1] Zingher, A.: Amer. Jour. Pub. Health, November, 1924.

*Does One Attack of Scarlet Fever Confer a Lasting Immunity?*—Of 26 nurses who had passed through an attack of scarlet fever whilst in this hospital, 23 gave a Dick negative reading, and 3 (11·5 per cent.) gave a positive reading.

*Active Immunisation.*

Dick and Dick [2] have found that it is possible to render the Dick reaction negative, in a susceptible individual, by the injection of suitable amounts of the specific toxin. When the dose is excessive a reaction is produced, consisting of malaise, nausea and vomiting, temperature, and a scarlatinal rash. The dose of toxin for immunising purposes is standardised in terms of the skin test dose.

The preparation of toxin employed and the method of administration, have already been described. We have estimated the immunising dosage in multiples of the skin test dose—*namely, 0·2 c.cm. of a 1 in 1000 dilution of toxin.*

By means of comparative Dick tests applied to nine Dick-positive reactors the toxin content of the immunising preparation (X79, B1811) was found to approximate very closely to that of the test toxin (X48).

A second series of comparative Dick tests performed with a 1 in 1000 dilution of the immunising toxin (X79, B1811), which had been kept in the ice-chest for some nine months in a dilution of 1 in 6, indicated that there had apparently been little or no loss of toxicity on prolonged storage.

*Immunising Dosage.*—To arrive at a suitable primary protective injection gradually increasing doses of toxin from 5 to 416 skin test doses were administered to groups of Dick-positive reactors, and any resultant local and systemic symptoms noted. Constitutional symptoms began to appear when the initial injection contained 208 skin test doses of toxin. Two out of 8 susceptible children, from 1 to 15 years of age, who received the above dose of toxin as a primary injection developed a slight scarlatiniform rash accompanied by a rise of temperature. Two subsequent injections of 416 skin test doses of toxin administered 7 and 14 days later to the same group of children produced no systemic disturbance.

When a primary injection of 416 skin test doses of toxin was administered to a group of 16 susceptible individuals from 1 to 12 years of age no fewer than 13 developed systemic reactions. The close resemblance of the reaction to an attack of scarlet fever was confirmed by the manifest alarm of the experienced ward sister, who, unaware of the nature of the injection, was of the opinion that an explosive outbreak of that disease had developed in her ward. It was again noted that the subsequent protective injections of 416 skin test doses of toxin administered 7 and 14 days later were unaccompanied by constitutional disturbance.

We finally decided to administer 200 skin test doses of toxin as a primary protective injection to susceptible members of the nursing staff. Fifty-one Dick positive nurses received immunising injections. To 35 of these, a course of 4 injections, at 5-day intervals, of 200, 400, 800 and 1000 skin test doses of toxin was administered. More recently, a course of 3 injections, at 14-day intervals, of 200, 1000, and 2000 skin test doses of toxin, has been tried in 7 nurses. Nine nurses, for one reason or another, did not complete the full course.

*Reactions Following Immunising Injections.*

The local reactions were on the whole trifling. In one nurse, a painful indurated area of erythema, 6 cm. by 5 cm., was accompanied by an erythematous rash which extended from shoulder to hand.

Fourteen nurses complained of more or less systemic disturbance following the primary protective injection. Slight headache was noted in five, whilst the remainder

[2] Dick, G. F., and Dick, G. H.: Jour. Amer. Med. Assoc., July 12th, 1924.

complained of headache, nausea, or vomiting, and lassitude. Two of the latter reported slight sore-throat. In no case was a rash observed. One nurse was excused duty for one day, and three for two days each. The symptoms appeared within a few hours of the injection, and lasted from a few hours to, in one case, three days. Systemic reactions were more marked in nurses who gave a brilliant positive Dick reading of 2·5 cm. to 3 cm. or more in diameter. An initial immunising injection of only 100 skin test doses of toxin, administered to a nurse whose Dick reaction measured 5 cm. by 3·5 cm., was followed by headache and nausea the same evening. A second injection of 200 skin test doses of toxin, five days later, resulted in headache and vomiting within some eight hours of the protective inoculation. There was a slight pseudo in this case 1 cm. by 0·7 cm. in diameter.

*Development of Immunity.*

Of 35 nurses who received the full course of four injections of approximately 200, 400, 800, and 1000 skin test doses of toxin, at five-day intervals, 33 were retested. Twenty (60·6 per cent.) were found to be Dick negative within 6 weeks of completion of the immunising course, whilst 13 still showed susceptibility, markedly diminished in the majority.

Of seven nurses who received the course of three injections, at 14-day intervals, of 200, 1000, and 2000 skin test doses of toxin, three became Dick negative with 2 weeks, 4 within 4 weeks, and 5 (71·4 per cent.) within six weeks of the administration of the last protective injection.

The administration of a second immunising course of from 1500 to 3000 skin test doses of toxin, to 13 remaining Dick positive reactors, resulted in seven becoming Dick negative within a period of four to 8 months from the completion of the primary immunising course. Three were still Dick positive at four, five, and eight months, whilst the remaining three left hospital.

Of the nine nurses who did not receive the full course of protective injections, five became Dick negative within two to five months of inoculation; one developed scarlet fever, which resulted in a negative Dick test in the fourth week of disease; two were still susceptible prior to leaving hospital six months later, and one has yet the course to complete.

Summarising these results we find that of 42 originally Dick positive nurses, 37 (88·1 per cent.) were rendered Dick negative by injections of the specific toxin, within varying periods of time up to eight months from the completion of the primary course of protective injections.

*Duration of Immunity.*

A retest was recently applied to a group of nine nurses, who 11 months ago were found to have developed immunity subsequent to a course of protective injections. Four still gave a negative Dick reading. The remaining five were again Dick positive. In a second group of five girls who became Dick negative subsequent to active immunisation, a retest applied eight months later revealed that two had lost their acquired immunity within that time.

It was noted that those nurses in whom the period of immunity had lasted less than 8 and 11 months respectively, had shown at the original test a high degree of susceptibility to scarlet fever, as evidenced by large and brilliant Dick reactions. Where the original Dick test indicated a slight susceptibility to the disease, not only was immunisation more rapidly attained, but in the few retested was still present 8 and 11 months later.

*Incidence of Scarlet Fever in the Nursing Staff.*

I regret to state that since this work was initiated some 18 months ago, two nurses, noted as Dick negative with the Edinburgh preparation of toxin, developed scarlet fever six weeks and six months respectively, after the application of the test.

In one case the test, read at 8, 24, and 48 hours, gave so indefinite a reaction that we were unable to measure the area involved, and hence was noted as query negative. This nurse developed undoubted clinical scarlet fever of moderate severity six weeks later. A positive Schultz-Charlton was obtained with a 1 in 100 dilution of scarlet antitoxin. The injection of 0·2 c.cm. of the patient's blood serum, obtained on the twenty-fourth day of disease, into a first day scarlet rash, produced an area of blanching 2·5 by 3·1 cm. in diameter. It is interesting to note that a Dick test applied on the third day of disease, with the London preparation of toxin (X48), gave a frank negative reading.

Another nurse, 18 years of age, who had not suffered from scarlet fever previously, when tested on Jan. 11th, 1926, showed at the 8-hour reading an area of faint erythema 1·0 cm. by 1·2 cm. on both test and control arms. At the 24 and 48 hour readings there was no reaction visible on either arm. The case was noted as Dick negative. On June 5th, 1926, this girl developed a mild attack of scarlet fever.

Six cases of scarlet fever have occurred in Dick positive nurses. In two the disease developed before the application of the test, but a positive result was obtained on the third day of disease in both cases. One nurse developed scarlet fever the day following the application of the test, and thus frustrated our recommendation that, on account of her brilliant Dick reaction, she should be excluded from duty in the scarlet fever pavilions until successfully immunised. Three nurses contracted the malady 11, 27, and 60 days respectively after completing the immunising course.

*Annual Incidence of Scarlet Fever in the Staff.*

During the year 1926 five nurses contracted scarlet fever. One case developed in a Dick negative reactor, whilst the other four occurred in Dick positive nurses. Particulars of these four cases have already been noted above. No nurse who was successfully immunised has yet contracted the disease.

In Table III. is shown the annual incidence of scarlet fever in the nursing staff during the past seven years.

TABLE III.—*Annual Incidence of Scarlatina in Nursing Staff.*

| Year | Total staff. | Number of cases of scarlatina in staff. | Incidence per cent. | Total number of scarlatina cases admitted. |
|---|---|---|---|---|
| 1920 | 148 | 14 | 9·46 | 1382 |
| 1921 | 146 | 15 | 10·27 | 1983 |
| 1922 | 147 | 9 | 6·12 | 1559 |
| 1923 | 137 | 6 | 4·38 | 1741 |
| 1924 | 128 | 11 | 8·59 | 1604 |
| 1925 | 161 | 15 | 9·31 | 1906 |
| 1926 | 142 | 5 | 3·52 | 1612 |

Owing to the wide fluctuation in the annual incidence of scarlatina among the staff, it is not possible to arrive at a definite conclusion, yet it is at least encouraging, that the lowest incidence yet encountered should coincide with the application of specific measures of prevention.

*Conclusions.*

1. By the injection, at intervals of from 5 to 14 days, of gradually increasing doses of scarlet fever toxin, it is possible to render the majority of Dick positive reactors Dick negative.

2. Providing the dosage is carefully graded this can be accomplished without the development of any unpleasant or permanent ill-effects.

3. Whilst active immunity can be attained by the injection of relatively small doses of toxin, its duration in cases originally strongly Dick positive is only a matter of months.

4. Should a more lasting immunity be desired in marked Dick positive reactors, much larger injections of toxin than we have employed are apparently necessary.

# TESTICULAR GRAFTING.

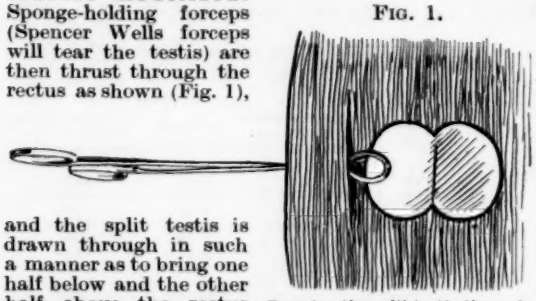
BY HAMILTON BAILEY, F.R.C.S. ENG.,
GILLSON SCHOLAR, SOCIETY OF APOTHECARIES; SURGEON DUDLEY ROAD HOSPITAL, BIRMINGHAM.

THERE is no doubt that the internal secretion of the testis has a very profound effect upon the vitality of the organism. The work of Voronoff has abundantly proved, in both men and animals, that the testicular hormone may be, at least temporarily, supplemented by a graft, which, in the case of man, is made from the anthropoid apes.

Voronoff's operation is to implant slices of the testis into the scarified tunica vaginalis, but this can only be done in those cases in which the tunica is distended by (even a small quantity of) hydrocele fluid. He states that the ideal site for the graft is within the tunica, for in this situation it is to a large extent nourished by the plasma (hydrocele fluid) which bathes it. Nevertheless, from a detailed study of his cases, we glean that the intravaginal implantation is, for anatomical reasons, rarely possible. Thus, of 43 cases in which operative details are given,[1] the site of the grafts was as follows: (1) outside the tunica vaginalis, 30; (2) partly outside and partly inside, 12; (3) entirely inside, 1. From these figures it can be gathered that as all the groups were equally successful the secretion of the tunica can have but little effect upon the nutrition of the graft. If this is so, there is nothing to recommend particularly the cellular tissues of the scrotum as the ideal site for a graft.

I have grafted the testis into the sheath of the rectus abdominis on five occasions by the following technique: The epididymis is cut away with scissors, and the testis split longitudinally. The rectus sheath is opened, and the medial border of the rectus muscle mobilised. Sponge-holding forceps (Spencer Wells forceps will tear the testis) are then thrust through the rectus as shown (Fig. 1),

FIG. 1.



Drawing the split testis through the rectus muscle.

and the split testis is drawn through in such a manner as to bring one half below and the other half above the rectus muscle. The edges of the cut surfaces are then sutured together (Fig. 2). The rectus muscle offers a uniformly satisfactory site for the implanted organ, as it is exceedingly well supplied with blood by the deep epigastric vessels.

In four of these cases orchidectomy had to be performed for maldescent of the testis. In all cases orchidopexy was impracticable because of the shortness of the vas deferens. The extirpated testis was placed in saline solution at body temperature until the inguinal wound had been sewn up. The testis was then grafted into the rectus sheath of its owner.

The fifth case is of sufficient interest to give some detailed notes:—

J. P., aged 65, was admitted to hospital on Jan. 10th, 1926, with a periurethral abscess and commencing extravasation of urine. For ten days he had had almost complete retention. The temperature was 102° F., and he was profoundly uræmic. Under intrathecal stovaine anæsthesia external urethrotomy was performed, and a catheter passed from the perineum into the bladder. The infiltrated scrotum was also incised. By the beginning of February, after a stormy convalescence, he had sufficiently recovered for us to contemplate the treatment of the stricture. At this time it was observed that he looked very old for his years, and that his mentality was sluggish. On Feb. 4th it was arranged to treat the stricture by internal urethrotomy. On the same day it was necessary to remove a maldescended testis from a healthy young man in whom orchidopexy had been, a year previously, attempted unsuccessfully. The excised testis, which was well formed, was transplanted into the rectus sheath of the old man.

I have had this man under weekly observation for a year. For six months the grafted organ could be felt in the abdominal wall undiminished in size. During the seventh month it rapidly decreased, and, at the present time (January) although palpable, it is only a quarter of its original dimensions. After making an allowance for an improved renal function, I am convinced that some degree of rejuvenation took place. The patient's movements became quicker, his expression more alert; he volunteered the information that his neighbours remarked upon his energy, and he was able to return to work after an enforced idleness of nearly three years. During the past two months I have detected some regression, but the patient remains in good health.

FIG. 2.

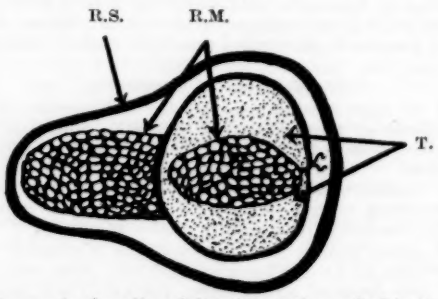



Diagram to show the relationship of the grafted testis to the rectus muscle. The operation completed.
R.S. = Rectus sheath. R.M. = Rectus muscle. T. = Testis.

The problem of scientifically estimating the effects of any type of rejuvenation is an exceedingly difficult one, and is not solved by the camera. After performing some 25 Steinach ligations in the course of such operations as prostatectomy and herniotomy in elderly men, I am uncertain of its result. On the other hand, testicular grafting appears to be a method full of promise, nevertheless, the restorative effect is probably quite temporary. In a country where anthropoids are scarce and antivivisectionists abound, the utilisation of extirpated maldescended testes, which otherwise could be thrown away, offers an economical, though limited, avenue by which we may add to our knowledge.

[1] Voronoff: Rejuvenating by Grafting. London: George Allen and Unwin, Ltd. 1925.

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*Erratum.*—Early copies of our last week's issue contained an obvious error. In the first column of Tables I., II., and III. of Prof. H. B. Dixon's special article on the Ignition Points of Gases in Nitrous Oxide (pp. 247, 248) the "lag" interval between the issue of the gas and its ignition should have been noted in seconds, so that the abbreviation following the figures should have been *secs.* instead of *in.*

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SPA PRACTITIONERS' ASSOCIATION.—A meeting held in London on Jan. 21st was attended by 20 medical men from various British spas. Dr. Kerr Pringle (Harrogate) took the chair, and on the motion of Dr. C. W. Buckley (Buxton), seconded by Dr. R. Ackerley (Llandrindod Wells), it was decided to form a society to be called the Spa Practitioners' Association, which should represent the interests of those engaged in spa practice. Membership is to be open to all registered medical men and women practising at a British spa, the annual fee for membership being 10*s.* 6*d.* The following officers of the Association were appointed: President, Dr. Kerr Pringle (Harrogate); Secretary, Dr. J. B. Burt (Buxton); Members of Council, Dr. Vincent Coates (Bath), Dr. F. Clayton (Leamington), Dr. R. Ackerley (Llandrindod Wells), and Dr. Leonard Boys (Woodhall).

# Medical Societies.

## TUBERCULOSIS SOCIETY.

AT a meeting of this Society, held on Jan. 14th, Dr. JAMES WATT, the President, in the chair, Dr. C. D. S. AGASSIZ read a paper on the

*Differential Diagnosis of Non-Tuberculous Fibrosis of the Lungs.*

His experience of this condition, he said, was confined to cases in children, and he wished to draw attention to some points in the differential diagnosis which were not sufficiently stressed. The incidence appeared to be greatest in children of from 5 to 10 years of age. There was no evidence of a familial tendency. A history of an antecedent attack of broncho-pneumonia or whooping-cough was commonly met with. The most constant symptom was cough, which recurred especially in the winter and was accompanied by little or no sputum. When sputum was present it was tenacious and mucopurulent. There might be a good deal of dyspnœa, which, however, appeared to cause comparatively little distress. Hæmoptysis was rare, but cyanosis was frequently present and was of some importance. Clubbing of fingers occurred in about two-thirds of the cases. The physical signs varied with the extent of the disease. The cardiac impulse was displaced; vocal fremitus might be diminished but was always present. Auscultation showed the breath sounds to be diminished; dry, leathery, creaking râles were usually present but were very inconstant. The temperature charts might either show a slight pyrexia of at most 101° or 102° F., which would fall in a day or two and would not be accompanied by increased respiration, or they might show a temperature rising sharply to 102° or more, remaining elevated for a week or so, and being accompanied by a respiratory rate of 30, 40, or 50. In 90 per cent. of these cases the Pirquet reaction was negative, while it was a curious fact that in 10 per cent. the Wassermann reaction was positive. Radiography was of great importance in cases of non-tuberculous fibrosis. The cardiac shadow was often displaced. Shadows were to be seen at the root of the lung and radiating from it, varying from slight streaks to dense striations. The diaphragmatic shadow was irregular, and "peaking" would often be found on the inner two-thirds of the diaphragm, being probably due to adhesions. The root-shadows and basal shadows might be more marked in one lung, but were usually seen in both.

The subjects of non-tuberculous pulmonary fibrosis, seemed, said Dr. Agassiz, liable particularly to secondary infections—e.g., otorrhœa, tonsillitis, and skin diseases such as impetigo. In pulmonary tuberculosis there was in about 80 per cent. of cases a history of contact with tuberculous infection. The history also frequently recorded influenza or hæmoptysis; whilst often the disease was only discovered during a routine examination at school. The sputum was more profuse than in pulmonary fibrosis. Hæmoptysis was frequent, but cyanosis was comparatively rare unless fibrosis was also present. Clubbing was usually absent or inconspicuous. The percussion note was impaired chiefly over the apex; adventitious sounds also were usually present there, and were more constant than in non-tuberculous fibrosis. Respiration might be normal, but the pulse-rate was usually increased. Radiography generally showed a woolly mottling at the apex or radiating down from it. The diaphragmatic outline was less irregular than in fibrosis. Septic complications were not common, and when present they were of the type usually associated with pulmonary tuberculosis—e.g., pleurisy.

The question arose, continued Dr. Agassiz, whether these two pictures might not represent different stages of tuberculosis. Personally he was no believer in the so-called hilum tuberculosis. Many cases began in infancy. He had under his care at that time six infants who showed all the signs he had enumerated as typical of fibrosis. The root shadows were only slightly increased. There was a definite contrast between the physical signs and the X ray picture in the two conditions, and another important distinction was the high percentage of negative Pirquet reactions in cases of fibrosis. It had sometimes been suggested that the tubercle bacillus might start the process and then die out or give rise to a peribronchial tuberculosis. He thought this sequence might occasionally take place, but probably not often, and it was difficult to see why the fibrosis should increase. The presence of cyanosis was also suggestive of fibrosis rather than of peribronchial tuberculosis. It had been shown that one-third of the lung area must be involved to produce cyanosis, and it was impossible to believe that one-third of the alveoli could be affected and yet give rise to no increase of root shadows. The after-history of the cases was also important. In a series of 50 cases of fibrosis, no less than 48 were still alive after three to four years, and all of these were at work. Lastly, there was the question of post-mortem evidence, which was suggestive, though not yet conclusive. He had had one or two post-mortem examinations on cases which had died of fibrosis, and sections examined microscopically showed no signs of tuberculosis.

Other diseases, said Dr. Agassiz, in conclusion, might also sometimes cause difficulty in diagnosis. Chronic bronchitis was uncommon in children; the chest tended to become emphysematous, and the percussion note hyperresonant. There was no displacement of the heart. Pleural effusion could be diagnosed by the exploring needle. Thickened pleura might present some difficulty, but in any case the condition was probably always present to some extent in fibrosis of the lung. In broncho-pneumonia diagnosis might not be possible during the height of an attack.

*Discussion.*

The PRESIDENT said that he found it difficult to get over the fact of a negative Pirquet in so many cases. If Dr. Agassiz were right, it meant that about one-third of the children that were being sent to sanatoriums were being sent unnecessarily. What happened to these children afterwards? They ought to turn into typical cases of bronchiectasis, but he doubted whether they did so, and whether there were enough cases of bronchiectasis to go round.

Dr. G. T. HEBERT said that he had followed up some of these cases of fibrosis for 10 or 12 years. He had often been struck with the physical well-being of the children who had extensive physical signs. He agreed with Dr. Agassiz that most of the cases were non-tuberculous, although the point could not be definitely settled till after the cases had been followed for a longer period. At one time he had come across two or three cases of pulmonary fibrosis associated with enlarged cervical glands, and would like to know whether this was a common association. The presence of moist sounds in the chest was difficult to account for in the comparative absence of sputum; possibly it was due to a certain amount of œdema. He agreed strongly with the statement as to the importance of radiography in these cases. Fibrous tissue, he thought, did not show up on X ray pictures as much as radiologists believed; lack of opacity was striking in these cases of non-tuberculous basal fibrosis. He looked upon these cases as the main source of bronchiectasis in adults, but the course taken by the disease naturally depended on the resistance in any given case.

Dr. MACDONALD concurred with Dr. Hebert's views as to the X ray appearance in cases of fibrosis, instancing a case of his own in which physical signs were found on the side which was most translucent on the screen.

Dr. G. B. PRICE said that he was not clear whether the fibrosis mentioned by Dr. Agassiz was localised or general. Vascular conditions almost certainly gave rise to fibrosis. He himself labelled cases as tuberculous with reluctance, but he had followed up a

large number of adult patients who had been diagnosed as fibrotic, and after some years tubercle bacilli had been found in the sputum of a certain number of them.

Dr. P. A. GALPIN said that he had come across a great number of cases in which there had been repeated attacks of broncho-pneumonia with a history of cough but a paucity of symptoms and a good general condition. Such cases, giving abundant physical signs but few symptoms, were probably non-tuberculous. There seemed to be here some analogy with cases of bone disease—tuberculosis contrasted with sclerosis of the bone. The tendency to destruction was greater in tuberculosis, while the tendency to sclerosis was greater in pyogenic conditions. The final test in both groups must be pathological.

Dr. C. F. PEDLEY said that at one time he used to receive cases unlabelled. Nearly all these were associated with a nasopharyngeal condition. As a school medical officer, he hardly ever diagnosed tuberculosis; a nasopharyngeal catarrh was usually present.

Dr. T. R. ELLIOTT agreed with the lecturer that a large number of cases were wrongly diagnosed as tuberculous. In Shropshire he had had cases with enlarged mediastinal glands in which there was definite fibrosis at the root of the lung. He wondered whether the fibrosis in such cases was congestive, due to pressure from the enlarged mediastinal glands. A history of contact with tuberculosis was an important point in the diagnosis, as was also a peculiar smell of sweat associated with tuberculosis.

Dr. BRAND thought that the fibroid type of tuberculosis was uncommon in children under 15 years of age, owing to the lack of resistance. He believed that bronchiectasis began at a much earlier age than the speakers appeared to think. Fibrosis merely represented the reaction of the tissues to a bacterial agent; it was symptomless and signless. Every degree could be present up to an extreme fibrosis causing interference with blood-vessels, alveoli, and bronchi. He also was a believer in the theory of Dr. Agassiz, and had no difficulty in looking upon these cases as non-tuberculous. He thought that a child who had pulmonary fibrosis plus bronchiectasis had very little chance of getting through to adult life without being notified several times over as suffering from pulmonary tuberculosis.

Dr. F. R. WALTERS said that the points of difference between the two conditions seemed clear in children, but diagnosis was not so easy in adults.

Dr. C. ROPER said that he had met with a large number of persons suffering from miner's phthisis, and was convinced of the widespread existence of non-tuberculous fibrosis, although it might happen sometimes that tuberculosis was engrafted upon it later on.

*Reply.*

Dr. AGASSIZ, in reply, spoke of the after-history of the patients. A certain number of cases, he believed, went on to bronchiectasis; others in adult life were labelled chronic bronchitis; some would probably clear up altogether. Lipiodol might throw a good deal of light upon some of these cases. Some probably did develop tuberculosis afterwards. He thought that cervical adenitis undoubtedly did occur in association with fibrosis. Interlobar pleurisy was probably not as uncommon as was sometimes believed, and it might quite well lead to fibrosis. One or two speakers had referred to the comparative rarity of pulmonary tuberculosis in children. About one-third of his own cases had tubercle bacilli in the sputum, and more than these had bacilli in the fæces. He had had quite a number of patients, aged three, who had had positive sputum. Symptoms in fibrosis were undoubtedly less complained of by children. He agreed that chronic nasopharyngeal infectious conditions were extremely common and might very possibly cause fibrosis, and he thought that fibrosis was more common in both children and adults than was usually recognised.

The PRESIDENT suggested that tuberculosis officers might help in the elucidation of the question by a careful following up of their cases of fibrosis.

# ROYAL SOCIETY OF MEDICINE.

## SECTION OF DERMATOLOGY.

AT a meeting of this Section held on Jan. 20th Dr. J. H. SEQUEIRA, the President, took the chair and Mr. H. S. SOUTTAR demonstrated the

ACTION AND USES OF A STEAM-HEATED CAUTERY

which has been described by him in THE LANCET.[1] The use of heat coagulation, he said, in the destruction of malignant growths often had advantages over their removal by direct surgery. When properly used there was no hæmorrhage, and it was thus possible to deal with fungating masses where the direct control of hæmorrhage by ordinary surgical methods was impossible. Provided the heat was applied at a low enough temperature, any degree of penetration could be obtained, and a dense covering of coagulated tissue was formed which allowed the deeper tissues to granulate under ideal conditions of asepsis. These results had usually been obtained by means of diathermy, but it had appeared to him that they could be got more simply and effectively with an applicator maintained at a constant temperature by a current of dry steam. His apparatus consisted of a small boiler in which "Meta Fuel" was used as a source of heat. The steam was slightly superheated by being carried directly through a flame, and was conveyed by a thick rubber tube to an insulated handle. This terminated in a nozzle on to which applicators of various forms and dimensions could be screwed, and the steam, after passing through the applicator returned by the handle to the discharge tube. The applicator was thus kept at a constant temperature of approximately 100° C., and so long as it was kept in contact with the tissues heat slowly penetrated and produced coagulation; as the temperature of the applicator was absolutely constant the depth of penetration could be gauged with great accuracy. With large applicators, and on moist tissues, penetration occurred at a rate of about one inch in ten minutes. With small applicators minute defects such as spider nævi could be destroyed in a few seconds. The range of applicability was therefore very large, and the instrument could be used with equal facility for the destruction of huge masses of fungating carcinoma and for the removal of minute cutaneous defects. The method had been found of peculiar value in the treatment of epithelioma of the skin arising on a scarred surface, e.g., after treatment for lupus and similar conditions by X rays. In such cases excision would leave a widely gaping wound which could only be closed with great difficulty. With the steam cautery these growths could usually be destroyed quite easily under local anæsthesia, and when the slough separated a granular surface was left which was easily covered by epithelium.

Mr. Souttar then described and showed a number of cases, most of which were reported in article already referred to.

Dr. H. SEMON showed three cases treated by the method.

1.—Carcinoma on lupus treated by X rays in 1904. The patient, a man aged 65, had suffered from lupus vulgaris of the right side of his face and nose for over 20 years. When he was seen at the Royal Northern Hospital in March 1926, there was a moist fungating tumour in the midst of a patch of X ray atrophy on the right cheek. The growth had extended deeply into the subcutaneous tissue and through the buccinator muscle. Under general anæsthesia the tumour was scraped away, over a palpating finger placed in the patient's mouth. This enabled the operator to ascertain that the mucous membrane was still intact. The exposed area was then treated with the steam cautery in its full extent, and for a distance of about half an inch beyond its apparent limits. The lesion healed completely in three weeks.

This case, said Dr. Semon, illustrated a notable advantage over diathermy inasmuch as with a finger

[1] THE LANCET, 1926, i., 805.

in the mouth it was very simple to estimate by the increasing heat the exact moment at which the application had to be stopped. Such a procedure was not feasible with an electrical coagulation method. The same very practical point was illustrated by the following case :—

2.—A man aged 63, came to hospital on March 10th, 1925, with a septic cauliflower growth on the left ear. The cartilage of the tragus and helix was definitely involved. There was no apparent glandular infection. The epithelioma was treated by diathermy, but recurred in September. The second attempt to eradicate it by this method resulted in a perforation of the cartilage. In September 1926, growth had again recurred and on this occasion—after a preliminary excochleation with the sharp spoon, Mr. Souttar's cautery was applied. The result to date is certainly encouraging, the only evident relic being the hole left by the second attempt to cure by diathermy, an accident which would have been impossible if the steam cautery had been used in the way suggested in case (1).

3.—A girl of 19 in August of last year asked for the removal of a small hairy mole over the right angle of lower jaw. The steam cautery was applied for about 10 seconds to the small stigma.

The result of this treatment, said Dr. Semon, well illustrated a complication whose possibility would have to be taken into account if the instrument was to be used for the treatment of cosmetic defects. A keloidal scar, such as was fairly common after burns, had developed, and would require treatment with radium. He was of opinion, however, that these and other cases confirmed the claims put forward on behalf of this new instrument. He thought that it had considerable advantages over diathermy. It was cheap to buy and run, could be carried from place to place, and was independent of an electric circuit and did not have the occasional breakdowns to which the diathermy plant was liable. Above all it was easy to manipulate and reasonably safe in the hands of any but the most inexperienced.

Dr. ARTHUR WHITFIELD inquired about the rate of penetration, which, he presumed, diminished with increasing depth from the surface.

The PRESIDENT said that he was able to support the statements made, from direct experience of the results of the treatment at the London Hospital. The results in some cases had been truly remarkable.

Mr. JOHN EVERIDGE, Dr. J. M. H. MACLEOD, and Dr. M. S. THOMSON also took part in the discussion.

## MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.

AT a recent meeting of this Society, Dr. JOHN COWAN, the President, in the chair, Mr. R. B. CARSLAW read a paper on

### UNDUE MOBILITY AND PROLAPSE OF THE ASCENDING COLON

as a factor in the causation of various abdominal conditions, based on the results of 242 cases treated by colopexy. An early symptom attributable to prolapse of the ascending colon, said Mr. Carslaw, was discomfort after food with more or less flatulence, developing later to actual pain, which was characteristically variable and inconstant. Later there were loss of appetite, increasing flatulence, and frequent bilious attacks, with headache, nausea, and malaise. Constipation might or might not be noticed at first, but was invariably present in the later stages. Finally toxic phenomena occurred, such as progressive wasting, pigmentation of the skin, chronic mastitis, and, most important of all, mental changes. These symptoms were observed in certain groups, which justified classification of the cases into clinical types according to whether they were duodenal, gastric, or referable to the right iliac fossa or elsewhere. Referring to the diagnosis of chronic appendicitis, Mr. Carslaw said that he considered that there was no such disease, and emphasised the distinction between recurrent attacks of true inflammatory appendicitis and the condition of choked appendix with appendicular colic, unaccompanied by inflammation. Some authors described renal and biliary types associated with attacks of renal and biliary colic, but in his own series these symptoms were additional to the other symptoms, and the patients were not classified in a separate category. Mucous colitis and chronic duodenal ileus were occasional late results.

Mr. Carslaw went on to discuss treatment under three headings: (1) preventive; (2) curative by suitable diet, laxatives, and exercises and (3) operative. The proper operative procedure, he thought, was to correct the undue mobility and prolapse of the cæcum and ascending colon by Waugh's colopexy. In certain cases fixation of the cæcum was sufficient, but in others not only must the whole ascending colon be fixed, but it was necessary to suspend the right half of the transverse colon as well. Restriction in the undue mobility seemed to be as important as correction of the prolapse, or, perhaps, more important still. Any developmental membranes should also be divided, and if there was kinking of the gall-bladder, with stagnation of its contents, it might be necessary to suspend or even drain it after division of its ventral membrane. The appendix, if present, should be removed, except in those cases of severe mucous colitis in which appendicostomy was required in addition to colopexy. Where there was marked hepatosis its correction might be helped by shortening the round ligament. The right kidney and the uterus should be left alone.

Mr. Carslaw summarised as follows the clinical results of 242 consecutive colopexies performed between March, 1920, and July, 1926:—

*Sex and Age Incidence.*

| Age. | Under 9. | 10–19. | 20–29. | 30–39. | 40–49. | 50–59. | 60–69. | Total. |
|---|---|---|---|---|---|---|---|---|
| Female | 1 | 19 | 63 | 57 | 33 | 11 | 1 | 185 |
| Male.. | 0 | 9 | 10 | 24 | 9 | 3 | 2 | 57 |
| Total . | 1 | 28 | 73 | 81 | 42 | 14 | 3 | 242 |

*Results.*

| Years since operation. | Less than 1. | 1–2. | 2–3. | 3–4. | 4–5. | 5–6. | 6–7. | Total. | % |
|---|---|---|---|---|---|---|---|---|---|
| Cured .. | 10 | 20 | 30 | 31 | 23 | 41 | 13 | 168 | 70·3 |
| Very much improved | 5 | 6 | 13 | 5 | 6 | 5 | 4 | 44 | 18·4 |
| Failures .. | 0 | 5 | 5 | 5 | 4 | 3 | 5 | 27 | 11·3 |

In the great majority of cases, he said, the symptoms disappeared within a few months of operation. The appetite, which had usually been very fickle, rapidly improved, and patients often reported that they were able to eat "anything and everything." The former "bilious attacks," especially in the duodenal type of case, persisted for some months, but were much less frequent and very much less severe. Although the characteristic pain, either after food or in the right iliac fossa, soon disappeared, a considerable degree of discomfort was felt in some cases in the right side of the abdomen; this worried the patient for about a year. The recovery from constipation—however obstinate it might have been—was one of the most satisfactory results. Sometimes a degree of constipation persisted, but as a rule the condition was absolutely cured. Another satisfactory result noted in many cases was the disappearance of menstrual irregularities; this occurred too frequently to be mere coincidence. There was usually a rapid improvement in general nutrition, with steady increase in weight, and the mental outlook was brighter. Of the 212 patients who were satisfied with their present condition, 44, although very much improved, were not, in his opinion, cured, as they still had some

discomfort, occasional flatulence, or some degree of constipation, or had failed to put on weight. The remaining 168 were absolutely cured, and that the cure was permanent could be seen from the number of years that had elapsed since operation.

*Discussion.*

Mr. ALEXANDER MCLENNAN said that in 1925 he had performed colopexy by Waugh's method in 20 cases. His object in opening the abdomen, however, had been to remove a suspicious appendix. He believed that the appendix ought to be removed on suspicion, and he wholly disagreed with Mr. Carslaw's contention that there was no such thing as chronic appendicitis. The benefits which followed from colopexy were sometimes extremely striking. It was always difficult to explain the benefit of fixation when the mechanics of the colon were considered. It seemed rather absurd to suppose that the ascending colon dragged on the liver, for one of the clinical signs of ascites was that the intestine floated upwards. The weight of the ascending colon was a negligible quantity, and he failed to see how it could influence the causation of duodenal ulcer, gall-stones, or any other out-of-the-way disease. He could not believe that the ascending colon, by its weight, could drag on any other structures in the abdomen at all. It used to be said that the kidney pushed the ascending colon down but he did not think that the ascending colon ever, pulled the kidney down. Mr. Carslaw had mentioned in connexion with Waugh's operation the straightening of the hepatic flexure. He (the speaker) suggested that one of the beneficial effects of Waugh's operation was the production of a kink at the hepatic flexure. What passed the hepatic flexure then passed it permanently. The mechanics of the abdomen and the question of abolishing mobility in the ascending colon were not so simple as they had been led to suppose.

Since 1905 at least, said Mr. McLennan, he had been in the habit of fixing all cæcums that he thought were exceedingly mobile. He had followed up several of the cases so dealt with, and he thought the procedure resulted in considerable benefit. Another benefit was the obliteration of the intercolic membrane. Mr. Carslaw wanted them to believe that the drop in the ascending colon was the initial process in enteroptosis, but it was an absence of muscular energy which allowed the prolapse. If in Waugh's operation a very good pit was made and the ascending colon was put into it, the hepatic flexure came close to the kidney. If the hepatic flexure was pushed from an anterior to a posterior position it was pulled upwards and thus spread out. Radiograms ought to be taken from the side to show the colon passing back into the loin. Cases of mobile cæcum were being constantly met with. In one man of 65, for instance, who had never been ill in his life, the first symptoms of the mobile cæcum were due to volvulus causing sudden intestinal obstruction. Tucking-in of the ascending colon allowed the musculature to contract; it made the whole colon shrink and acted as a great support to it. In another case presenting symptoms of chronic obstruction, the descending colon, on exploration, looked as if a Waugh's operation had been done on it. Mobilisation of the colon cured the condition. It must not be forgotten that sometimes striking results were obtained from very slight interference in the abdomen. He thought Mr. Carslaw incorrect in saying that children had highly placed ascending colons. A great deal was said about the ills of humanity being due to the upright position, but he thought the majority of the ills of humanity were due to the want of the upright position.

*Another Series of Cases.*

Mr. W. A. SEWELL said that colopexy was often denounced most bitterly by those who had little knowledge of the operation. If critics would inform operators of their failures, much useful information would be obtained. A definite conclusion could only be reached by the analysis of a large number of cases over a considerable period. Since 1920 the operation had been performed in the Victoria Infirmary by himself or Mr. Macrae in 127 cases. Of these patients he had been able to trace only 69, of whom 32 were perfectly well, and 16 much improved. In 21 cases the operation had failed, and four of these patients had later died (acute meningitis, tuberculosis, excision of gastric ulcer, and cause unknown). He had deliberately treated two cases by colopexy where the pylorus was under suspicion, but a gastrojejunostomy had been required later and had been followed by marked improvement.

Some criticised the operation, said Mr. Sewell, on the ground that the symptoms were often due to appendicitis, which was cured by removal of the appendix when colopexy was done. Some of the cases were found on admission, or at a later date, to have an appendix normal in size and appearance; but in addition there was a large, loose cæcum which could easily be pulled out of the wound. The true diagnosis in these cases was, in his opinion, a volvulus of this loose cæcum. Appendicitis was now so well known to the public that the appendix often got credit to which it was not entitled. Lichty had reported in 1923 on a series of 400 cases of "chronic appendicitis." Of these, 225 had been cured; in 175, therefore, there had been a mistake in the diagnosis. Colopexy was not an alternative to gastrojejunostomy for cases of pyloric ulcer, but was an attempt to prevent the formation of ulcers, and to remove the pull of the loaded ascending colon in that and other regions. It was an attempt to cure the symptoms accompanying local and general visceroptosis. Colopexy, he thought, undoubtedly lessened and often removed the pain associated with floating kidney; certainly it restricted its movements. The results of the operation were by no means perfect, but they were encouraging, and the operation was worthy of further investigation.

*Criticism of Claims for the Operation.*

Mr. DONALD DUFF regarded the claims put forward for the operation as extravagant. Common dyspepsia, constipation, gastric ulcers, mesenteric ileus, and even dysmenorrhœa had been put forward as results of a mobile colon; but mobility of the cæcum and ascending colon were normal conditions, and a fixed colon would be the abnormal condition. Much had been said about the presence of bands about the lower ileum and cæcum as being of developmental origin, and Lane's ileal kink had been spoken of as one of these. He had had pieces of these bands removed at operation, and had subjected the parts to culture, with the result that *Bacillus coli* had been grown from practically all of them, proving that the bands were inflammatory in origin and secondary to constipation. A mobile cæcum was frequently seen at abdominal operations, but every case he had seen of such a condition had also a "last kink" well developed. If developmental error was the cause of mobile colon, as claimed by Mr. Carslaw, it was curious that women should have been selected by nature for the exhibition of this deficiency in the proportion of over 3 to 1, as stated in Mr. Carslaw's statistics. These figures in fact proved that the enlargement and mobility of the cæcum was secondary to the constipation prevalent in the female sex; it was due not to developmental error but to bad habits. He had been able in many instances to cure these cases of obstinate constipation by division of the bands alone without colopexy. Colopexy could not be adequately performed without division of Lane's bands, but it was the division of the bands and not the colopexy which produced any good result.

*Appendicitis and Colopexy.*

Mr. ROBERT TENNENT said that Waugh's operation was attractive because it did not deform nor interfere with the normal physiological action of the bowel, and because it held out prospects of eliminating the dangerous and inefficient methods of colectomy and short circuit. Still the claim was so great that

he felt a little sceptical. He himself had been much impressed by the results of colopexy. Nearly all his own cases had been of the right iliac fossa type. Hardly a week passed in hospital without an urgent case being admitted labelled "appendicitis," in which the main symptom was pain in the right iliac fossa. Some of these patients had been dismissed without operation and later had been readmitted. On operating, it was invariably found that there was a very mobile cæcum, and in these cases simple removal of the appendix would probably be nearly valueless. Appendectomy for so-called chronic appendicitis was useless if the cæcum was mobile. He had traced about 60 cases where cæcopexy had been performed, and was very pleased with the results. With regard to colopexy he could not speak with the same freedon. He had rarely done an exploratory operation with the idea of performing colopexy, but he had done colopexy in cases where he had opened the abdomen for some other condition. In these cases he was convinced that the operation had been well worth while. He had also been struck by the fact that in the few cases of colopexy in males the results had been very unsatisfactory. In each of these cases the patient had probably suffered from what Mr. McLennan called defective innervation of the colon, for great dilatation was present. In such cases there had been no beneficial results whatever. He thought that the relative frequency of the loose colon in women was due to repeated pregnancy. With regard to the transverse colon, Waugh's main point was that the ascending colon was the first part of the bowel which had to propel against the force of gravity. The transverse was in a better mechanical position for dealing with the contents than a mobile ascending colon. A mobile ascending colon had a lot to do with chronic duodenal ileus, and its correction sometimes had very beneficial results.

*Experience of the Results.*

Dr. JOHN RITCHIE, giving details concerning some 30 of his patients on whom Mr. Carslaw had operated, said that it was impossible to be apathetic or indifferent when the state of these patients before operation was contrasted with their present condition. Some had had pain at a varying period after meals, with flatulence, eructations, gurglings, and splashings. Some had had pain a considerable time after meals, with attacks of vomiting. One had had such severe pain that a pin-hole perforation of a duodenal ulcer was suspected. One had had mucous colitis in addition to other symptoms. In some cases the pain had been referred to regions other than the abdomen—e.g., the heart, the back, the pelvis, the leg. Many suffered from depression, sleeplessness, and obstinate constipation, and some had had previous operations. His notes in many cases extended over a considerable period, some of them dating from 1907, and they showed that the patients had been never long off the sick list, turning up with monotonous regularity as semi-invalids. He considered the results in practically all his cases to be most satisfactory, relative or absolute health being restored by the operation.

Dr. WALLACE ANDERSON said that all the cases in his series (operated upon by Mr. Carslaw) were drawn from the east end of the city, where conditions were unfavourable to complete and speedy convalescence from any abdominal operation. Of 11 cases, he considered that seven were complete "cures," inasmuch as they were now free of symptoms and quite able to carry on their pre-operation duties. Of the remaining four, two patients admitted improvement, being able to work, but not being as well as they ought, and hoped, to be. Of the other two cases one had a gastrojejunostomy performed some years previously, with no remission of symptoms, and the result of his colopexy was still uncertain. The last case had been, he thought, a complete failure. She was a typical "abdominal woman," who had had two abdominal operations, presumably gynæcological, without benefit. In answer to the criticism that Waugh's operation was effective because it removed a chronically inflamed appendix, he was able to state that in all his cases the appendix had been to all appearance normal. His own conclusion, reached after observation of a small number of cases over a number of years, was that colopexy had a definite place in abdominal surgery and deserved careful consideration.

Dr. W. M. KNOX said that during the last five years he had had 18 cases treated by colopexy, ten of them had been of long standing and had symptoms of chronic gastro-intestinal intoxication, such as mucous colitis, anæmia, anorexia, constipation, and nervous symptoms. All these cases had been treated by dieting, rest for varying periods, and intestinal antiseptics, with only temporary relief. All welcomed operative treatment as a possible escape from their prolonged suffering, and with only two exceptions the results had been satisfactory. In three of the other cases the appendix had been previously removed without any amelioration of the condition, but after colopexy recovery was complete. The remaining five cases had been of the gastric type of comparatively short duration and were completely cured. He therefore welcomed the operation as a satisfactory means of treating a condition which medical treatment had failed to help.

*Mechanism of Cure.*

Dr. DOUGLAS RUSSELL said that he found difficulty in understanding why, if a mobile cæcum was such a very important factor in the causation of duodenal ulcer, only 10 per cent. of these cases were associated with duodenal ulcer. There seemed to be a discrepancy. Many of the cases were said to be associated with defective innervation, but his opinion was that it was the mentality of the patient that was at fault. Dr. Russell showed an X ray film of a patient with a mobile cæcum treated by colopexy four years previously. The film showed the cæcum lying in the deepest point of the pelvis, and the stomach atonic and greatly ptosed. Yet the patient was undoubtedly cured by operation, although the colopexy had been a complete failure. The difficulty was to estimate whether patients of the "mental" type were likely to benefit by operation. Such patients could be diagnosed almost at sight by their flabby aspect and stance, due to a wide sigmoidal curve of the vertebral column.

Mr. JAMES TAYLOR said that it had been suggested that the various bands occurring in connexion with the bowel were congenital in nature and were not acquired as the result of downward traction by the loaded intestine. It was perfectly true that there were congenital bands, because the bowel must be supported in some way, even in the child. But the bands that Lane had so aptly described as the "crystallisation of lines of force," developed *within* the congenital folds. The one at the termination of the ileum was oftenest seen, not because it was actually the commonest, but because it occurred in the region of the abdomen most often explored by the surgeon. It would be seen that this band was a dense white fibrous fascia between the layers of the mesentery, and the under surface of this mesentery had to be cut through to allow of this band being divided. It was a structure that had formed in a congenital fold. Mr. Taylor suggested that the benefit resulting from colopexy was due to straightening of the terminal ileum. This part of the bowel formed a very acute arch, with the cæcum and last inch of the ileum on one side and the next portion of the ileum on the other. Lane obtained his result by dividing the band supporting the summit of the arch, whilst Waugh, by fixing the cæcum and ascending colon at a higher level than they were before, brought the outer limb of the arch into line with the inner limb. As Lane also straightened out the kinked pelvic colon, colopexy was really a modification of part of Lane's operation.

Mr. JAMES RUSSELL also spoke, and Mr. CARSLAW concluded the discussion with a reply.

## EDINBURGH OBSTETRICAL SOCIETY.

AT a meeting of this Society held on Jan. 12th, Prof. R. W. JOHNSTONE, the President, in the chair, Dr. JAMES YOUNG read a paper entitled

*Recurrent Pregnancy Toxæmia and its Relation to Placental Damage.*

In 1914, he said, he had brought before the society evidence suggesting that the eclamptic phenomenon was caused by absorption of toxic elements rapidly elaborated in a mass of dying placenta. Since then it had been shown in other connexions that extremely toxic materials, such as histamine and tyramine, might be produced from disintegrating tissue. He had at that time described the placental lesion, and, as Strachan had shown recently, his general views had since been confirmed by Clamenz, M'Nalley and Dieckmann, Adair, Soli, and others. The assault on the placenta was of such a kind that if it operated over a considerable area of the organ it might cause immediate ending of pregnancy by abortion, premature labour, or accidental hæmorrhage, without toxæmia. Where, however, the damage was less marked, it might be consistent with continued life of the fœtus, and, therefore, with the time necessary for the development of the toxic elements responsible for the eclamptic attack. Such a view was in harmony with the well-known facts that no essential part of the eclamptic process was direct damage of the fœtus, the life of which might be unharmed even in the most fulminating case, and that, on the other hand, severe eclampsia might suddenly subside after the intra-uterine death of the fœtus and the consequent complete detachment of the placenta.

Dr. Young brought forward new evidence derived from a study of 220 successive cases of toxæmia and accidental hæmorrhage in parous women in the Edinburgh Royal Maternity Hospital. It was found that in eclamptic cases there was a recurrence of eclampsia or non-convulsive toxæmia in over 30 per cent. This was clearly an underestimate because it did not allow for those cases in which the toxæmia occurring in the last pregnancy, for which the patient was admitted to hospital, was the first of a recurring sequence. In addition there was in eclamptic cases a 40 per cent. chance of the occurrence in successive pregnancies of abortion, premature labour, accidental hæmorrhage, or stillbirth. Examples of this sequence were the following series of pregnancies :—

*Case A.*—(1) Premature, (2) and (3) eclampsia.
*Case B.*—(1) Abortion, (2) and (3) eclampsia.
*Case C.*—(1) and (2) Abortion, (3) eclampsia.
*Case D.*—(1) to (7) Normal, (8) to (10) abortion, (11) eclampsia.

In other words, the morbid process resident in the patient and damaging the successive pregnancies might be primary or acquired. In many of the damaged pregnancies of the sequence there was no toxæmia. Thus :

*Case E.*—(1) and (2) Normal, (3) premature stillbirth with no toxæmia, (4) eclampsia.
*Case F.*—(1) Normal, (2) premature, (3) normal, (4) stillbirth with no toxæmia, (5) premature with no toxæmia, (6) eclampsia.

*Accidental Hæmorrhage.*

It had long been known, continued Dr. Young, that the same absence of toxæmia occurred in many cases of accidental hæmorrhage. Toxæmia was present in only about 40 to 50 per cent., and even in patients who died as the result of the hæmorrhage, there might be no evidence of toxic changes in the liver, kidney, or other organs. The toxæmia was an accident, and when present was apt to be intense in cases of concealed hæmorrhage—i.e., in cases where the damaged placenta was retained within the uterus. Dr. Young showed that the same abortion, premature birth, toxæmia sequence occurred in this condition. Thus :

*Case G.*—(1) Normal, (2) abortion, (3) accidental hæmorrhage.
*Case H.*—(1) Normal, (2) accidental hæmorrhage with toxæmia, (3) abortion with no toxæmia, (4) accidental hæmorrhage with no toxæmia.

The sequence, said Dr. Young, was found in 18 out of 55 cases (32 per cent.). He believed that the data indicated that the causes of eclampsia and the related toxæmia of pregnancy were to be found amongst the causes of abortion and premature birth—namely, those which operated by means of placental damage. Toxæmia was an accident occurring only in those cases in which, after the placenta was damaged, the abortion or premature birth did not take place quickly enough. He stated, further, that the recognition of the high incidence of recurrence in true eclamptic toxæmia and, in eclamptic cases, of the considerable tendency to recurring abortion, premature labour, &c., made necessary a revision of our views regarding so-called nephritic toxæmia. It was generally believed that there were two groups of late pregnancy toxæmia, the eclamptic or non-recurrent, and the nephritic or recurrent. This distinction was now untenable. This statement did not, of course, apply to those comparatively few cases of renal disease clearly acquired before pregnancy—for instance, from scarlet fever—which were sharply marked off from the specific toxæmia in which nephritis was secondary. Dr. Young believed there was now much evidence for the view that the late pregnancy toxæmias, whether eclamptic or nephritic, had a similar origin in the diseased placenta, and that kidney damage in such cases was secondary and was often aggravated by successive toxic pregnancies. This was supported by his own investigations and by those of others, which indicated that chronic nephritis might succeed even one eclamptic attack.

Dr. DOUGLAS MILLER read a communication on

*Occipito-Posterior Position of the Vertex,*

based on an analysis of 750 cases of occipito-posterior presentation, mostly seen at the Edinburgh Royal Maternity Hospital. In all cases, except for the abnormal position, labour was uncomplicated by contracted pelvis or other major abnormalities, and the series comprised only those cases in which diagnosis of posterior position was made or confirmed during labour. They were classified into the following four groups :—

*Group 1.—Spontaneous rotation* of the occiput to the front occurred in 474—i.e., in rather more than 60 per cent. This figure probably gives too low an estimate of frequency of anterior rotation, as the review necessarily omitted cases admitted late in labour, in which forward rotation of a primarily posterior position may have already taken place. Where anterior rotation occurred, the average duration of labour was greater than in primary anterior positions by 2¾ hours in primigravidæ and by 1¾ in multiparæ. In 51 cases forceps delivery was ultimately necessary because of fœtal distress or rigidity of the pelvic floor.

*Group 2.—Spontaneous delivery with face to pubes* took place in 88 cases, in nine of which the infant was the second of twins. In most of the remainder the children were small or the vaginal orifice abnormally lax.

*Group 3.*—In 48 cases (6·4 per cent.) the head was seriously delayed at the inlet of the pelvis. In approximately two-thirds of these manual rotation of the head was carried out. This manœuvre was, as a rule, followed by forceps extraction, although in many cases no further assistance was required. Rotation of the head was effected by means of forceps in five cases. Internal version was performed in 12 cases and gave much less satisfactory results. In the majority of cases, however, this operation was not one of election, but was done as a last resort after labour had become seriously prolonged. Craniotomy was performed in two cases in which fœtal death had already occurred.

*Group 4.*—In 140 cases the head was arrested at a low level in the pelvis with the occiput posterior. Manual rotation followed by spontaneous or forceps delivery was the treatment adopted in rather more than half of these cases. In about 25 per cent. rotation was effected by forceps. Extraction of the child face to pubes was employed in a small number of cases of severe impaction, whilst craniotomy was performed in eight cases in which delivery of a living child was considered impossible.

Discussing these different methods of dealing with the persistent occipito-posterior presentation, Dr. Miller said that the results were found to be definitely

unfavourable to forceps rotation. In emphasising the importance of diagnosis, he pointed out that in most cases it was possible to decide at an early stage in labour whether forward rotation was likely to occur or not, by careful abdominal and vaginal examination, or by noting such signs as were shown in the following table:—

| — | No. of cases in which noted. | (Termination malrotation or non-rotation). | Spontaneous forward rotation. |
|---|---|---|---|
| Early rupture of membranes .. | 197 | 145 (74%) | 52 (26%) |
| Delayed engagement of head .. .. | 139 | 107 (77%) | 32 (23%) |
| Fœtal heart heard both in flank and in opposite anterior lower quadrant .. .. | 103 | 78 (76%) | 25 (24%) |
| Normal engagement and rupture of membranes at or near full dilatation of os .. .. | 332 | 33 (10%) | 299 (90%) |

Dystocia was greatest and morbidity highest, said Dr. Miller, in the persistent posterior case in which assistance had been delayed until serious impaction had occurred, and he suggested that in the restricted group of cases in which clear indications of faulty flexion were present, rotation of the head and body of the child might with advantage be carried out at or near the commencement of the second stage of labour. This proposal of early interference did not run counter to the conservative policy so generally applicable in the management of labour; for against a manœuvre which was comparatively simple and safe when done early, there had to be placed the high probability of difficult intervention after the mother had become exhausted by hours of suffering and fatigue, and fœtal life had sunk to a low ebb.

## MANCHESTER MEDICAL SOCIETY AND PATHOLOGICAL SOCIETY.

A JOINT meeting of the Manchester Medical Society and the Pathological Society of Manchester was held on Jan. 12th, Dr. A. A. MUMFORD in the chair.

### *The Dick Test.*

Dr. D. S. SUTHERLAND opened a discussion on the Clinical Value of the Dick Test and the Preparation and Use of Scarlet Fever Toxin and Antitoxin. He said that in 30 cases of definite scarlet fever during the first three days of the rash distinguishable blanching was obtained in dilutions of immune serum up to 1/5000 in from 12 to 24 hours. In two doubtful cases of scarlet fever, where no blanching was obtained, the subsequent clinical symptoms confirmed the diagnosis as being due to a cause other than scarlet fever, and in three cases where the rash was definitely due to another cause no blanching was observed. Among the members of the nursing staff at Monsall Hospital, 15·3 per cent. were found by the Dick test to be susceptible to scarlet fever, and were immunised before being detailed for duty in scarlet fever wards; 23 per cent. were found susceptible to diphtheria and were protected by immunisation. During the last six months no cases of scarlet fever or diphtheria had occurred among nurses thus protected. Diphtheria patients to the number of 354 were Dick-tested on admission to hospital, of whom 55·9 per cent. were found susceptible to scarlet fever; the percentage of susceptibles was found highest—83·3 per cent.—at the age-period of 1 to 2 years. The number of scarlet fever patients Schick-tested on admission for susceptibility to diphtheria was 589, of whom 56·5 per cent. were found susceptible. The percentage of susceptibles was highest at 5 years of age, reaching 75 per cent. The standard of immunity of diphtheria patients to scarlet fever was lower than that of patients suffering from scarlet fever to diphtheria, up to the age of 5 years. After 7 years the reverse applied, and in both diseases the standard of immunity was much lower than among an average healthy community.

A table of Dick tests with a standard dilution of 1/1000 classified according to day of disease, on 566 definite cases of scarlet fever on admission to hospital, showed, in a survey of 463 patients during the first five days of illness, that 83·6 per cent. were Dick positive. Of those giving negative reactions during this period, 36 had intensely marked rashes, which may have masked the reaction. On the second day of rash 86 per cent. were found to be positive reactors, and, by including possible masked reactions where the rash was intensely marked, this percentage of positive reactors could be raised to 95·5. It was suggested that the remaining 4·5 per cent. of negative reactors might be accounted for by rapid development of immunity during the incubation and invasive period of the disease. These figures closely approximate to those of Zingher, of New York. Dick tests on 150 early cases of scarlet fever, at successive short intervals, demonstrated the establishment of immunity in 90 per cent. of cases at from nine to fifteen days, the remaining 10 per cent. becoming negative in from two to three weeks. In a scrutiny of nearly 800 cases of scarlet fever during the last five months, in about 20 cases where the diagnosis of scarlet fever was undoubted, and where susceptibility, as indicated by the Dick test, had persisted beyond four weeks, a reinfection or relapse had in nearly every case occurred, at periods varying from four to six weeks, followed in a few days by a Dick-negative reaction. It was noted that these cases were marked in the primary attack by a very slight degree, or absence, of pyrexia, the other symptoms, including subsequent desquamation, being characteristic. It was recommended that such cases be actively immunised, to establish immunity by the twenty-first day. Three hundred skin doses of toxin were sufficient to change a Dick-positive to a Dick-negative reaction, and this dose was unattended by any constitutional disturbance. A Dick test on all cases at the onset of illness and on the twenty-first day was recommended. The use of the test was summarised as follows:—

1. A very strongly positive reaction early in the disease and again late in convalescence speaks against the diagnosis of scarlet fever.
2. A definite negative reaction during the first two days of rash should put one on guard that he is not dealing with a case of scarlet fever.
3. The Dick test should be applied to the diagnosis of sore-throat and pyrexia associated with definite cases of scarlet fever in the same family.
4. The test is useful in determining the establishment of active immunisation and in estimating the potency of antitoxic serum.
5. In the diagnosis of scarlet fever, the test should be interpreted in relation to the susceptibility of healthy individuals at the age period of the patient.
6. The test is specially useful on the occurrence of scarlet fever in a diphtheria ward. The Dick test made, on admission, will indicate without delay the susceptible patients, and protection can be immediately rendered by a prophylactic dose of immune serum. During the last year, on two occasions, in a diphtheria ward of 50 beds, an outbreak of scarlet fever had been followed by no secondary cases when such a course was adopted.
7. It is recommended that in surgical wards where exposure to scarlet fever is suspected, patients who have not previously suffered from scarlet fever should be Dick-tested before operation and prophylactic serum administered where the reaction is positive.
8. The value of immunisation in case of extensive burns is indicated, even in the absence of exposure to the infection of scarlet fever.

Dr. R. A. O'BRIEN called attention to the importance of the protection of nursing staffs in fever hospitals and the 10 per cent. incidence of scarlet fever in some hospitals. At Monsall both diphtheria and scarlet fever were in process of disappearing since Schick and Dick testing and immunisation had been introduced. Amongst the nurses, apparently 40 out of 45 with a previous history of scarlet fever gave a negative response to the Dick test, and 18 out of 19 nurses with a previous history of diphtheria gave a negative response to the Schick test. The

Dick test during the first three days of the attack of scarlet fever was positive in the Monsall series in 217 out of 251. It was noted, however, that 28 of the negative reactors had very vivid rashes. Presumably in such cases the capillaries are dilated to their fullest extent by the circulating toxin, and no local introduction of the Dick test amount of toxin can increase this dilation. In other words, these patients present a "universal Dick-positive response." If one deducts these 28 cases, the test was positive in 217 out of 223 patients—i.e., 97 per cent. The figures for the test applied up to the fifth day of the disease are 388 positive and 27 negative ("vivid rashes" being eliminated)—i.e., 93 per cent., whereas from the sixth day onwards the percentage drops to about 60. All such collections of figures show that measurable immunity develops rapidly in the average patient at or about the fifth day. This agrees with clinical experience. The Schultz-Charlton test was positive in all of 35 successive cases admitted and tested during the first three days of the rash. The test is obviously of considerable use in practice, and it is now in routine use in several hospitals in the examination of all "doubtful" cases of scarlet fever. Blanching in this series has been got with serum diluted to 1/4000. Evidently a reasonably good serum for clinical use will in this dilution produce blanching in the great majority of patients tested during the first two days of the rash. The clinician has thus in his hands a method of rough measurement of the clinical value of any serum he proposes to use for treatment. Comparison of the Washington Dick toxin with that in use in many places in this country suggests that in corresponding dilutions the two toxins are of nearly equal potency. The comparison will be resumed later when a further sample of the American toxin is available. Apparently amongst some 600 to 800 patients convalescent from scarlet fever at Monsall, about 20 gave a positive response to the Dick test at or after the third week of convalescence. The Monsall plan was to give a small injection of toxin to patients found to be Dick negative on the twenty-first day and the resultant negative Dick reaction a week later was of great interest to the immunologist and probably of equal interest to the administrator. It might prove to be a better way than giving passive immunity to such patients with antitoxin. "Second attacks" of scarlet fever during the stay in hospital cause a considerable amount of trouble to all concerned.

Dr. O'Brien showed figures illustrating the results got by the Parish-Okell rabbit test,[1] which he said promises to be of considerable use in the titration of antitoxin and possibly, conversely, of identification of pathological hæmolytic streptococci.

[1] THE LANCET, Jan. 8th, 1927, p. 71.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Committee 44 cases were considered and £769 13*s.* 6*d.* voted to 40 applicants. The following is a summary of some of the cases relieved:—

Widow, aged 36, of M.B. who died suddenly in November last. Left with one child aged 2 entirely unprovided for. She has recently had a major operation and will not be fit for work for six months. Late husband had to help to support his mother and sister which prevented his leaving adequate provision for his wife and child. An emergency grant of £10 sent and a further sum of £26 in four instalments was voted.

L.R.F.P. & S. Glasg., aged 84. Four children. Wife, aged 80, is paralysed and helpless. Only income £12 from investments, old age pension £52, and allowance of £90 per annum from second son who also pays for the maintenance of his elder brother who is in a mental hospital. Eldest daughter, aged 51, is at home and looks after her parents while the youngest earns 25*s.* a week in a warehouse. Rent and rates amount to £36 per annum. Emergency grant of £10 made and a further sum of £10 in 12 instalments voted.

Daughter, aged 52, of M.D. who practised in the North and died 1874. She lost money on a boarding-house which had to be given up at the end of nine months. Teaches music, but from lack of pupils asks the Fund for assistance. She is lame. Total received from teaching in the last 12 months was £88, and £11 from the rent of a house in Scotland. Rent and gas 12*s.* 6*d.* a week. Voted £18 in 12 instalments.

Subscriptions may be sent to the Honorary Treasurer, Sir Charters Symonds, at 11, Chandos-street, Cavendish-square, London, W. 1.

# Reviews and Notices of Books.

JACOBI'S ATLAS OF DERMACHROMES.

Fourth edition. With a new and original text by HENRY MACCORMAC, C.B.E., M.D. London: William Heinemann, Ltd. 1926. With 322 coloured illustrations and two half-tone figures. Two vols. £5 5*s.*

THE first English edition of this well-known German Atlas appeared in 1903, with an English adaptation of the text by the late Dr. J. J. Pringle. A second edition, containing 159 coloured and 13 black-and-white plates, followed in 1906, and at the urgent request of Prof. Jacobi's colleagues was made more complete by a supplement which contained 76 additional coloured plates. A German edition, published by Jacobi in 1913, and dedicated to his former teacher the late Prof. Neisser, contains 266 coloured and two half tone plates, while the fourth English edition now under review retains all the original plates, and has increased their number to 322. It has also undergone a revision in respect of grouping and general arrangement, and is now a perfect work of its kind. The colour standards and the method of printing remain unaltered; it is difficult to see how there could be a better reproduction of flesh tints until photography in natural colour from the living subject is simplified, and made practicable in the clinic.

The value of such a collection of plates is comparable to that of a series of specimens in a museum of pathology. The dermatologist can use it for teaching purposes or for comparing his own cases with those of colleagues—distant in space or time. The practitioner will prize it as an aid to memory, and the fortunate student who has access to such an atlas is enabled to study details which a hurried examination in the out-patient department does not often permit.

This is not to suggest that this or any atlas can take the place of careful and repeated study of the actual lesion on the living subject, but that it is a most admirable adjunct thereto. A new and entirely original contribution to this edition is the explanatory text by Dr. Henry MacCormac. This is more detailed than is usual in a work of the kind, and almost reaches the dignity of a text-book of dermatology. The descriptions are concise and very clear, all theoretical discussion being avoided. The sections on diagnosis and treatment (particularly that of syphilis) are equally satisfying, and if the reader can master and memorise all that is here written, he will have obtained sufficient knowledge to cope with most of the skin cases likely to engage his attention in private practice. By the new method of grouping employed, the differences between pemphigus and dermatitis herpetiformis, small-pox and varicella, the various drug eruptions, and other rashes which superficially resemble each other are readily appreciated, and may save the practitioner from potential errors of diagnosis. A few gaps in the illustrations might profitably be filled in subsequent reprints or editions. There are no pictures, for instance, of the sarcoids, although they are dealt with in the text, while illustrations of acute eczema, furunculosis, and carbuncle might also find a place. An alphabetical list of plates accompanies each volume and retains the old and partly discarded classical names used at the time of Hebra and Kaposi. The obvious criticism that arises is stifled by the addition of an excellent English index to be found at the end of the second volume. The arrangement and nomenclature are thus rendered comprehensible to any reader, and the work gains an international character.

The book as a whole is a credit to British dermatology, on which both the annotator and the publishers deserve congratulations.

## DISEASES OF THE SKIN.

Fourth edition. By JAMES H. SEQUEIRA, M.D., F.R.C.P. Lond., F.R.C.S. Eng., Physician to the Skin Department and Lecturer on Dermatology at the London Hospital. London: J. and A. Churchill. 1927. Pp. 644. £2 2s.

Dr. Sequeira and his publishers are much to be congratulated on this, the latest edition of one of the best known text-books on dermatology. Without the least increase in bulk the work has been completely modernised, and contains in readable form all that can be regarded as proven in an expanding and increasingly complex branch of medicine. The number and excellence of the illustrations, all of them from typical examples of skin diseases—and many of them in their natural colours—will appeal to the novice, and will not be disdained by the more experienced practitioner. The text has undergone no radical alteration, and maintains the concise and lucid style of previous editions. In the table of contents there is an improvement in the printing of the various headings, and an increase in their number from 26 to 27, brought about by the introduction of a chapter on disease caused by filterable and other viruses.

Dr. Sequeira's clinical experience, probably unrivalled in this country, enables him to give authoritative statistical information based on his own figures. The section on the sarcoids, our knowledge of which has been considerably augmented since the last edition was published, contains a good summary and three excellent illustrations from one of the most interesting types of the disease. Similar improvements are to be noted in the chapters on ringworm, the erythrodermias and lupus erythematosus. The chapter on syphilis may be regarded as the latest word on this vast subject. Dr. Paul Fildes's contribution on the Wassermann reaction has been extended to include a short account of the "Sigma" test. On the subject of light therapy, which Dr. Sequeira was one of the first to sponsor in this country, he is regrettably brief. His readers would have welcomed from his pen a more detailed exposition of general technique and dermatological indications. Apart from this lost opportunity to steady the claims of some of our more enthusiastic radiotherapists, it is difficult to detect a weak spot in this absorbing and conscientious compilation.

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## HYDROGEN ION CONCENTRATION.

*Hydrogen Ion Concentration.* Its Significance in the Biological Sciences and Methods for its Determinations. By LEONOR MICHAELIS, M.D., Professor in the University of Berlin, Resident Lecturer in Research Medicine in the Johns Hopkins University. Vol. I. Principles of the Theory. Authorised translation from the second revised and enlarged German edition, by WILLIAM A. PERLZWEIG, M.A., Ph.D., Associate in Medicine and Chemist to the Medical Clinic in the Johns Hopkins University and Hospital. London: Baillière, Tindall and Cox. 1926. Pp. 299. 22s. 6d.

*Les Ions d'Hydrogène.* By W. KOPACZEWSKI. Paris: Gauthier-Villars et Cie. 1926. Pp. 322. Fr. 70.

*Hydrogen Ion Concentration of the Blood in Health and Disease.* By J. HAROLD AUSTIN, Professor of Research Medicine, University of Pennsylvania; and GLENN E. CULLEN, Professor of Biochemistry, Vanderbilt University Medical School. London: Baillière, Tindall and Cox. 1926. Pp. 75. 9s.

THE question of hydrogen-ion concentration and its determination has invaded the province of practically every biological and medical science. Starting at first with the researches of Sorensen, it soon became of paramount importance in physical chemistry, was then applied to the study of enzymes, and its subsequent invasion of the field of colloid chemistry made an understanding of the new principle fundamental to the study of biological science.

The first monograph to appear on this subject was Prof. Michaelis's "Wasserstoff-Ionen-Konzentration." This was published in Berlin in 1914 as a single volume, and contained a brief account of the biological application of the subject, together with some practical methods for the determination of hydrogen-ion concentration, and for many years this formed the only available source of information. The fact that the work was written in German precluded many workers from taking advantage of the information it contained, and many people who were unacquainted with the language studied German specially to enable them to read the book. Every statement in the volume was correct, and every experiment when repeated turned out exactly as described. The second German edition of this work was published some years ago, when, though the literature in the subject had already grown to considerable proportions, it was most welcome, and the English translation of this edition now published will be a great help to workers in this field, for in a subject itself difficult to understand the handicap of attempting to grasp it in a foreign language is considerable. The English version is more than a mere translation, too, since it has the full sanction of Prof. Michaelis, who has himself added to the text, bringing it quite up to date.

The volume is divided into two parts, the first of which deals with the chemical equilibrium of the ions, and the second with the ions, particularly the hydrogen ions, as sources of electric potential differences. The first chapter explains the law of mass action and its application to the dissociation of electrolytes and of water. The methods of calculating the concentration of hydrogen ions from the concentration of acids and bases in solution and for determining the iso-electric point are explained. The second chapter deals with the determination of titrable acidity, pH value and buffer value, while the third chapter, on the dissociation of strong electrolytes, explains the theory of activity and its significance for the pH of buffers. The next chapter deals with some complications in the laws of dissociation which arise in connexion with undissociated salt molecules, and in the fifth chapter what is known concerning dissociation in non-aqueous solutions is described.

Part 2, Chapter VI., deals with the electrode potentials. Nernst's theory of metal electrode potentials is expounded and applied to concentration chains, and especially to gas chains as being the most important for physiological work. The biological significance of diffusion potentials, potentials at phase boundaries, and membrane potentials is dealt with in the following chapters, and the volume concludes with a section on adsorption potentials and electrokinetic phenomena. Adsorption is explained and the position of the H- and OH-ions in adsorption is demonstrated by using as the adsorbent charcoal, when all cations compete with the H-ions and all anions with the OH-ions. The theories of electro-endosmosis and electrophoresis are explained, and their relation to the ionic theory described. Diaphragms are also dealt with, and the application of adsorption potentials to physiology and colloidal chemistry is described.

As will be seen from the above summary, the volume is concerned mainly with the biological considerations of the subject, but the matter set out is of such importance that no person working in a biochemical laboratory can afford to ignore it. Subsequent volumes, particularly those dealing with the technique for the determination of hydrogen ions and its application to various biochemical and medical problems, will be eagerly awaited.

Prof. Kopaczewski's work covers the same ground with less theory and mathematics. The volume is divided into three parts, the first of which deals with some theoretical considerations, such as the laws of

electrical dissociation. The section dealing with the measurement of hydrogen-ion concentration contains an exhaustive account of technique, electrical and colorimetric, some even of the very old methods being included. Very full descriptions and illustrations of apparatus are given, including that made by the Cambridge Instrument Co. In the third part of the book the author discusses the applications of hydrogen-ion concentration in analytical, industrial, biological, and physiological chemistry. Its application in biology and medicine is also considered, and although this section has necessarily been condensed, it contains a good account of hydrogen-ion concentration in normal fluids and tissues of the body, and also in certain pathological conditions. A valuable addition is the list of buffer solutions, which list includes all the most recent and well-known ones. Prof. Kopaczewski's book is a complete and reliable treatise on a complicated subject.

Prof. Austin's little book is concerned with various factors which combine to make the pH constant. The first chapter deals with the general considerations, nomenclature, and the methods whereby the pH of the blood is regulated. The last section of the chapter is disappointing, since there is no mention of the acid base equilibrium in relation to gastric and pancreatic secretion, and the renal mechanisms seem to have been overlooked. The second chapter is concerned with the normal values of serum, blood, and the body fluids in general. This chapter consists only of three pages, of which one is occupied by a graph; the normal mechanisms for the regulation of pH might well have been treated more fully, in order to prepare the reader to cope with the third chapter, which deals with abnormal acid base balance. Here the introductions of acids and bases into the body are discussed, and also those conditions where excessive losses of acid and base from the body occur. There follows a detailed account of the pH of the blood in various diseases. Chapter IV. is concerned with the determination of hydrogen-ion concentration by various methods. This chapter is hardly full enough to be of practical value, and yet is too involved to serve as a general description of the methods for the non-technical reader.

Throughout the book rather too much is taken for granted; more details are needed where only mathematical formulæ are given and a fuller explanation of the normal mechanisms would certainly be appreciated. But the book remains a successful effort to cope with an extremely difficult task and should increase the interest among clinicians in the basic principles on which modern biochemistry is founded.

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FUNDAMENTALS OF THE ART OF SURGERY.

By J. H. WATSON, M.B., B.S. Lond., F.R.C.S. Eng., Surgeon to the Victoria Hospital, Burnley. London: William Heinemann, Ltd. 1926. Pp. 349. 17*s.* 6*d.*

Mr. Watson has written a book which may be recommended to all who are about to assume the responsibilities of an active surgical career. The table of contents would lead us to believe at first that another of the usual text-books of minor surgical matters for house surgeons had been offered to us. This is not so. The ground covered is much more restricted than in most books of that type. Indeed the volume does not make a strong appeal to those who are looking for a text-book on the details of the technique of minor surgery. The author has a mission of far higher value in his insistence upon essentials—those ultimate qualities upon which the work of the true surgical artist is based. Operating is not surgery, neither is surgery all operating. So we find chapters upon the art of surgery, surgical efficiency, surgical judgment, case-taking, and prognosis—chapters which are full of wisdom. This is the best part of the book, though elsewhere will be found useful hints on operative technique, after-treatment, the management of shock and hæmorrhage, and other such matters.

SURGERY OF THE STOMACH.

*Die Chirurgie.* Edited by Prof. Dr. M. KIRSCHNER (Königsberg) and Prof. Dr. O. NORDMANN (Berlin). Part X. *Die Chirurgie des Magens und des Duodenums.* Berlin: Urban and Schwarzenberg. 1926. Pp. 329.

THE high level maintained by previous volumes in this system of surgery is again manifest here. Three authors share in the production of this part of the work—namely, Prof. N. Guleke, Prof. H. Nieden, and Prof. H. Schmidt. More than 100 pages are occupied by general considerations such as anatomy, physiology, and methods of investigation of the stomach. Descriptions follow of the ordinary operations which are employed in gastric surgery, including such little used methods as that of Goepel for carrying out the Billroth I. procedure. The operation of duodeno-jejunostomy, to which so much prominence has been given by Pierre Duval and D. P. D. Wilkie, receives bare mention. An extremely interesting section is that by Prof. Schmidt, who has collected all information available on the subject of the alteration of the mechanics of the stomach after resection or anastomotic operations. Such knowledge is not so widespread amongst surgeons as its importance warrants. The special part of which the remainder of the book is composed gives systematic and complete descriptions of the several diseases. It is possible to find full information on any one of them, including the rarer affections such as syphilis, actinomycosis, or volvulus of the stomach or injury to the duodenum, whilst at the end of each chapter is a complete bibliography. Sound and unbiased judgment is pronounced upon debatable subjects. For instance, under the heading of gastroptosis is given an account of the well-known clinical phenomena of the disease with a review of surgical measures which have been devised for its relief. Though good results from suspension of the stomach were claimed at one time by the author, he does not hesitate to state how unsatisfactory has been the condition of the patients some years later. He has abandoned such procedures, but claims to have obtained success in a few cases after performing a Billroth II. procedure. The same serious consideration is given to the discussion of ulcers of the stomach and duodenum. All the available knowledge on the subject has been drawn upon, so that these chapters form a balanced review of the surgery of this disease. The reader is the gainer in that the facts are set forth for him to form his own judgment, while definite pronouncements are reserved for matters generally accepted as beyond dispute. The section on cancer of the stomach is one of the best we have seen. The book is illustrated with some pleasing coloured plates.

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## JOURNALS.

JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXX. No. 1. Pp. 1–184. January, 1927.—The Diurnal Tides of the Leucocytes of Man, by A. F. Bernard Shaw (Newcastle). An account of this paper appears in our editorial columns (p. 301).—The Action of Cyanides on Bacteria, by F. M. Burnet (London). Bacteria may be divided into two groups according to their growth—e.g., streptococci, pneumococci—or failure to grow—e.g., staphylococci, diphtheria, plague, typhoid, *coli*, &c.—on media containing cyanide. The difference is associated with different types of respiration.—Thrombo-angeitis Obliterans, by J. Marnoch and Edith MacRae (Aberdeen). A good description of a case of this rare disease, with an account of the anatomy and histology of the leg which was amputated.—Infection of Rats by Gaertner's Bacillus, by C. Price-Jones (London). If a large number of rats are fed with Gaertner's bacillus a few die and the rest show signs of illness. Forty-eight hours after feeding the bacillus can be found in the spleen and liver of nearly all the animals; after about ten days

it begins to disappear, so that at the end of two months it can be recovered from only 10 per cent. of rats. In a minority it survives at least five months. These surviving animals are to all appearances quite healthy, but if they are put to live with fresh uninfected rats they can initiate an epidemic.—The Supposed Presence of a Pressor Substance in the Blood of Patients with High Blood Pressure, by F. R. Curtis, A. A. Moncrieff, and S. Wright (London). No evidence of such a substance was obtained.—Neoplasm in a Porose Crocodile, by H. H. Scott and J. Beattie (London). A sarcoma, originating probably in the liver with growths in the heart and brain, found in a crocodile from the Malay States at the Zoo.—Chronic or Subacute Herpetic Meningo-encephalitis in the Rabbit, with Some Observations on Calcification, by C. Da Fano and J. R. Perdrau (London). A chronic form of herpetic encephalitis can be produced in rabbits by using partially immunised animals or an attenuated virus. The histological changes are fully described and well-illustrated, and considerable attention is given to the apparent calcification which is found in nerve-cells and other structures. The disease bears a considerable resemblance to encephalitis lethargica in man.—Complement Fixation with Bilharzia, by N. Hamilton Fairley (Bombay). Alcoholic extracts of bilharzia cercariæ in its molluscan hosts act specifically in complement-fixation tests. As far as can be made out they are free from protein. They are also effective as antigens when injected into goats. Infected goats give a much quicker and larger antibody response than normal animals, so that the method may be used in diagnosis.—On the Relation of the Alcohol-soluble Constituents of Bacteria to their Spontaneous Agglutination, by P. Bruce White (London). The "rough" variants of the food-poisoning bacteria generally agglutinate spontaneously in salt solution of ordinary strength. After extraction with hot alcohol, chloroform, or ether, emulsions are stable, but their sensitiveness to salt can be restored by impregnating them with the alcoholic extract. The alcohol-soluble material itself is soluble in distilled water, but is easily precipitated by the addition of salt.—The Rapid Death of the Meningococcus and Gonococcus in Oxygenated Cultures: the Part Played by the Development of an Unduly Alkaline Reaction, by H. V. Phelon, Georgina M. Duthie, and J. W. McLeod (Leeds). The production of considerable quantities of acid in bacterial cultures is well known; an inhibitory or fatal amount of alkali may also appear under certain conditions, due in the main to ammonia and alkaline carbonates arising from the oxidation of sodium salts of fatty acids.—Observations on the Sonne Dysentery Bacillus and *Bacillus coli anærogenes*, by D. Nabarro (London). The Sonne bacillus has been isolated under other names for some years in this country in children's diarrhœa and other conditions.—An Epidemic of Fowl Typhoid, by S. Miller and F. B. Smith (Harrogate). An account of a widespread epidemic of this rather uncommon disease in Upper Nidderdale, in which *Bacillus sanguinarium* was isolated.—Some Observations on Streptococci Occurring in Children, by Vida J. Perry (London). *Pyogenes*, *mitis*, *fæcalis*, *salivarius*, and *infrequens* were the chief varieties met with in a mixed collection of diseases.—Prophylaxis of Measles with Convalescent Serum, by S. Miller and F. B. Smith (Harrogate). Gives an account of the successful application on a small scale of this method.—Leptothricosis, by I. Mackenzie (Glasgow). Description of the pleomorphic leptothrix organism isolated from the cerebro-spinal fluid of ten cases of this obscure disease which is becoming susceptible to diagnosis.—Observations on the Relative Value of the Wassermann and Kahn reactions in cases of Congenital Syphilis, by D. McClean (London). A study of 767 tests supports the delicacy and accuracy of the Kahn reaction.—Obituary notices of John George Adami (with portrait and bibliography) and William Edward Marshall.—Proceedings of the Pathological Society of Great Britain and Ireland.

JOURNAL OF PHYSIOLOGY. Vol. LXII., No. 1. Cambridge University Press. 12*s.* 6*d.*—The Arterial Pressure in the Eye, by W. S. Duke-Elder. The author measured the pressure in the branches of the retinal artery of anæsthetised cats and the pressure in the ophthalmic artery. No method has yet been devised to measure the capillary pressure in the eye, but it is probable that in the arterial capillaries it rises at least 30 mm. Hg higher than the pressure in the chamber of the eye—i.e., to about 50 or 55 mm. The vascular pressures, although by themselves they prove nothing, make it possible that the aqueous humour is formed purely by a process of dialysation.—Insulin and the Production of Acetone Bodies by the Perfused Liver, by H. S. Raper and E. C. Smith. The isolated dog's liver when perfused with defibrinated blood has been shown to produce small amounts of acetone bodies, but much larger amounts if ammonium or sodium butyrate is added to the blood. The authors' experiments were designed to gain an insight into the anti-ketogenic action of insulin, which in severe diabetes stops the formation of acetone bodies. By experiments described it was found that a cat's liver in situ when perfused with its own blood produces acetone bodies in quantities proportional to the fat content of the liver, and inversely proportional to its glycogen content. No evidence was obtained that insulin influences this action of the liver. The increased production of acetone bodies following addition of sodium butyrate to the blood is unaffected by addition of insulin. About 80 per cent. of the theoretical acetone is obtained from sodium butyrate added to blood perfusing the liver. There was no evidence that in the isolated perfused liver insulin causes a deposition of glycogen even when the concentration of blood-sugar is several times as great as normal, or that it causes increased glycogenolysis. The perfused hind limbs of the cat remove glucose from the blood much more rapidly when it contains insulin than when it does not, but this effect is inhibited when pig's blood is used for the perfusion. A method is described for the estimation of butyric acid in blood.—The Impulses Produced by Sensory Nerve-Endings, Part 4, Impulses from Pain Receptors, by E. D. Adrian. The author analyses the impulses set up in cutaneous nerves by painful stimuli and compares the pain discharge with that of other receptors. The older view that pain resulted from excessive stimulation of any cutaneous receptor has been largely abandoned in favour of the idea of special pain receptors and conductors. Impulses produced in cutaneous nerves by painful stimuli to the skin have been recorded in the cat and in the frog. By the use of a sharply localised stimulus (the prick of a fine needle) the number of fibres in action can be restricted so that individual impulses are recorded without interference. With a constant stimulus (the needle pressing with a constant weight on the skin) the frequency of the discharge declines rapidly from its initial maximum value. With an increasing stimulus (the needle being slowly driven through the skin) the frequency rises gradually and declines again when the movement is stopped. The intensity of the pain sensation in man follows much the same course. The impulses produced by the pain receptors have the same time-relations as those produced by pressure receptors (cat) and muscle receptors (frog). The frequency of discharge in each fibre seems to cover the same range and there is nothing characteristic in the grouping of the impulses. The only distinction that can be drawn between the discharge of the pain receptor and that of other receptors lies in the very brief discharge with weak stimuli. It is suggested that these brief discharges may not be adequate to evoke the pain response but may serve instead for momentary sensations of contact, the development of the pain response depending on the summation of impulses in the central nervous system. Since the range of frequency of each fibre is much the same for all the receptors investigated, it is presumably determined by some common factor, such as the properties of the naked axis cylinder, and not by the

particular structure of the end-organ.—On the Cellular Mechanism of Bile Secretion and its Relation to the Golgi Apparatus of the Liver Cell, by W. Cramer and R. J. Ludford. In the cells of all secreting glands except the liver the specific products of secretion are passed out of the cell in one direction only. But the cells of the liver pass glycogen into the blood stream and at the same time take up bile-pigments and bile-salts from the blood. Each cell thus subserves an internal and external secretion. The authors' observations lead them to conclude that in the liver cells the bile constituents appear as a secretion within the Golgi apparatus, which in the process of bile secretion first enlarges and then fragments. The fragments are dispersed through the cytoplasm and reach the periphery, where they pass their contents into the intercellular bile capillaries.—The Sensitising Action of Alkalies, by A. Hemingway. That the tone and activity of tissues containing plain muscle is largely dependent on the reaction of the fluids bathing them has long been known, and there is evidence that certain drugs are more effective when used in an alkaline medium. The author found an increasing reaction of mammalian blood-vessels, uterus, and small intestine to successive changes in pH towards the alkaline side. An exaggerated response to adrenalin accompanies the reaction to alkalies.—Reversal of the Action of Adrenalin, by B. A. McSwiney and G. L. Brown. The type of response produced by adrenalin is related to the condition of tonus of the gastric musculature of the rabbit, an inhibitory response being obtained in the tonic or contracted muscle, an augmentor response in the atonic or relaxed muscle.—The Application of the Ethyl Iodide Method to the Determination of the Circulation-Rate in Women, by Winifred C. Cullis, Olive Rendel, and Ellen Dahl. The stroke-index gives an average output for Women of 1·7 c.cm. per kg. of body-weight from the right side of the heart during rest.—The other papers are the Effect of $CO_2$ on the Absorption of Alcohol and the Influence of Alcohol on the Diffusion of $CO_2$ in the Small Intestine, by N. Edkins and M. M. Murray.—The Differential Paralysis of Cardiac Nerve-Endings and Muscle, by W. R. Witanowski.—The Buffering Power of the Blood of *Maia* Squinado, by Phyllis M. Tookey Kerridge.—The Recovery Heat Production in Tortoise Muscle, by W. Hartree and G. Liljestrand.—The "Interference" of two Flexion-Reflexes; an Examination of Vészi's Experiment, by T. Graham Brown.—The Effect on the Chronaxie of Thyreo-parathyroid-ectomy, by N. Douglas Buchanan and H. S. D. Garven.

ARCHIVOS DE LA CLINICA MEDICA. Del Prof. E. Prado Tagle, Santiago, Chile. 1926.—This volume is the first of a series of clinical reports which Prof. Tagle hopes to issue to illustrate the work done in his clinic. For six years he has been engaged in bringing the clinic up to date and making it worthy of the principal hospital in the capital of Chile. It now has a well-equipped laboratory besides a policlinic which supplies the wards. It is interesting to note that the whole has been organised on a contributory basis, both in- and out-patients always giving something unless quite destitute; the proceeds are shared between the staff and hospital, and the system is said to work well. The clinical articles include one by Prof. Tagle on endocarditis lenta, an exhaustive examination of German views on the nephropathies by Dr. R. Vicuna Herboso, and about ten other contributions by members of the staff, all illustrated from the clinical work of the hospital. The volume is well printed and produced, and promises to be the prelude to an interesting series of records.

MENTAL AFTER-CARE ASSOCIATION.—The Prince of Wales has consented to preside at a meeting of the Association to be held at the Mansion House on Thursday, March 31st, at 3 P.M.

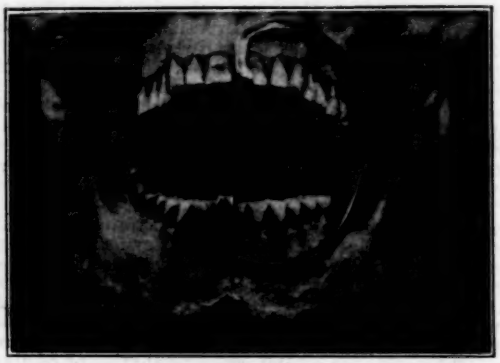
# New Inventions.

## A NEW MOUTH PROP.

OPERATIONS upon the teeth, mouth, and throat under an anæsthetic require the use of some kind of prop to hold the mouth open. I do not know of any device for holding the mouth open which is entirely satisfactory. Those in general use have many serious faults. They are liable to slip, they get into the way of instruments, they obstruct the view and, in the case of extraction of teeth, necessitate the use of the Mason's gag if teeth on both sides of the mouth are to be removed. The mouth prop described here leaves the mouth entirely unobstructed, and it cannot possibly slip. Practically any tooth on either side can be extracted without interference by the prop.

The device consists of an open frame made of oval wire, shaped so that it lies in the sulcus between the cheek and the jaws at the top and bottom of the mouth. The front ends of the frame are bent to form rests for the edges of the upper and lower incisors. When in position the frame lies inside the cheek, between the cheek and the gum over the apices of the teeth, and is right out of the way, as will be seen from the illustration.

The illustration shows the mouth prop in position on a skull. Being smooth and polished the prop slips into



the mouth quite easily. When in position the cheek keeps it there, and should the mouth be opened wider the prop does not move or get out of place. I have found that patients, as a rule, prefer it to the ordinary gag, as there is nothing for them to feel with the tongue. A piece of rubber tubing is pushed over the ends where the teeth rest, and the whole thing is simple and easily sterilised. Three sizes are necessary for all ordinary cases, and it can be used on either side of the mouth. It can also be made for cases where the upper or lower incisors are missing, the hook in this case being replaced by a flat pad to rest on the gum. For surgical purposes it can be made for use in edentulous mouths by having two gum rests instead of the hooks.

I have used it frequently in my practice and found it extremely useful, extractions of the four first molars being made very much easier, especially if the anæsthetist is not too expert with Mason's gag. For operations on the tonsils and throat I should think it would be ideal. It is also useful in the case of very young children, as it is impossible for them to push it out with the tongue or to move it without putting the hand to the mouth. There are, of course, certain cases where it would not be suitable, as when the incisors only are to be extracted, or when the jaws are abnormally shaped, but for the majority of cases I think it will be found to be a great improvement upon the types at present in general use.

It is made by The Amalgamated Dental Company, Ltd., 5–12, Broad-street, Golden-square, W.

E. A. SEBASTIAN HOARE, L.D.S. R.C.S. Eng.

# THE LANCET.

*LONDON: SATURDAY, FEBRUARY 5, 1927.*


## THE PAYING PATIENT.

ONCE again we are reminded by outspoken words from a prominent medical man of the inevitable changes which are lying ahead in the administration of our voluntary hospitals; and some of these changes need no longer be called inevitable, for they have passed beyond such a stage and have begun to occur. Mr. R. G. HOGARTH, the President of the British Medical Association, in the short address on the future of voluntary hospitals, which is published in another column this week, sets out the present position, with attractive arguments for its reform in certain directions, and he will find few to gainsay the words that he has spoken; but many may wish that he had allowed himself time to consider more fully the position of the paying patient, whose arrival, as a serious proposition in hospital management, he notes, and whose more frequent occurrence he prophecies on the strongest evidence.

The practical difficulties inherent in the introduction of the extension to paying patients of the amenities of the voluntary general hospitals will not prevent their increasing presence. One of these—namely, the avoidance of all risk lest beds upon which the poor have absolute claims may be filled by more prosperous patients—is a matter which we look with confidence to see cared for in the strictest manner by all hospital committees, in conjunction with all hospital staffs. Strict supervision and much tact are here required, but the right procedure can be ascertained in most cases, and the public may feel assured that the grand charity of the institutions will never be allowed to undergo curtailment. But a completely new difficulty in hospital administration is brought about with the appearance of paying patients. From those who had nothing nothing was expected to them all was given, and given with the lavish attention that was implied in the subscriptions and donations of the public. The public gave the money, the medical workers gave all else. With the introduction of paying patients, the question of what should be paid for arises, and here we have a difficulty to meet which no common pattern has been devised, so as to be followed by either the medical or the lay administration of the hospitals; nor have the ramifications of the difficulty been thought out in detail or made the subject of any authoritative advice. In true British style we have got into the middle of the situation before designing the best ways out; equitable solutions of the various problems will arise, not, perhaps, uniformly but none the less well adapted to meet different emergencies; but so much evidence of the growth of pay-wards is now available that some orderly plans to meet the position, as it arises, would be welcome. Certain sound proposals have received concrete form in decisions of the Representative Body of the British Medical Association, but we do not know of many hospitals which regulate by these the admission of private in-patients. The circumstances that have brought about the demand for paying wards in general hospitals and for the establishment of paying hospitals need no description—all are familiar with the big underlying facts. First, a vast class of patients, having no claim on charity, and not dreaming of putting one forward, cannot meet the expenses accompanying many serious illnesses; and secondly, for certain of these illnesses, whatever the private means of the patient, institutional treatment is the best course. Accordingly pay-wards are widely needed and being provided. At the end of last year a report on the voluntary hospitals of Great Britain appeared, in which Mr. R. H. P. ORDE, the acting director of the hospital service of the joint Red Cross Council, gave some notable figures. By these he showed that in a grand total, composed of nearly 39,000 beds in general hospitals, and 7300 in special hospitals, 75 per cent. of the institutions had a credit balance, while the payment by patients, either of the full or partial costs of maintenance, or by certain direct weekly fees, was playing a considerable rôle in bringing this favourable position about. This is a tale of moderate success, and even of great success when the position is compared to that of the previous decade, but in the favourable struggle to maintain solvency no provision is made for large and inevitable capital expenditures, to meet which grants and subsidies must still be hoped for. Certainly there is no surplus here which can be relied upon to provide any payment for medical service, if it should be posited that paying patients have a right, after the preferential claims of the poor have been met, to all the amenities of hospital service upon payment of establishment charges only.

This situation cannot be expected to escape professional attention; it has been much before the eyes of medical men, but regularly eludes those of the lay public. Modern medicine and surgery are day by day being made more available to every class of the community, but while the prime reason for the existence of voluntary hospitals will not be lost sight of, the relations between the public and their medical advisors must not be weakened. The value of these relations is spoken of in terms of money when the question of fees is debated; but money does not represent the essential value, although it is the element which forms the convenient subject for discussion here. The patient whose means allow him to go to a private nursing home does so with complete freedom and choice as regards the services of his physician or surgeon; in many cases he remains in the care of his own private practitioner who calls in such consultant advice as he deems wise. The connexion other than that of fees remains undisturbed. While it would be impossible for such a system as prevails in these homes to run concurrently with hospital routine in a general hospital, will it be feasible for it to remain in force in paying wards attached to a general hospital? If not, paying patients may lose forms of coöperation in their treatment which would prove salutary, and retention at home may be insisted upon where every feature in the case calls for institutional care. We have here but one problem of many which the arrival of paying-wards heralds, but it is one of importance.

## FEE STANDARDISATION.

LATELY a judge in Belfast has decided that a doctor is not entitled to grade his charges according to his patient's means. Capacity to pay, it seems on this judgment, must not be taken into account; the doctor must place rich and poor upon an absolute equality when he makes out his charges. Is this the idiosyncrasy of an individual judge, or do the law courts begin to perceive a change in public opinion which future decisions must reflect? At present

there is a legal implication that a professional man is to be paid for exercising his professional skill. If no figure is agreed beforehand, the law courts will allow him to recover what is just and reasonable. If any scale of charges is established as customary, that scale will be taken to be just and reasonable. General practitioners have undoubtedly established the custom of grading their fees according to the patient's income, the income being roughly estimated by the supposed rental of the house. This time-honoured arrangement has for many years been recorded, amongst other places, in the pages of "Whitaker's Almanack," where the relation between house rent and fees (still expressed in the old pre-war values) is published in parallel columns for the information of the public. The principle involved in these figures has not been challenged; it is regularly advanced as an accepted one in the unfortunate case of a legal dispute about medical fees; and judgments adverse to practitioners have been founded without exception, we think, upon other circumstances than the consideration of the charges in combination with the house-rent paid. Perhaps the principle was, in part, developed from the ancient notion—applicable still to the fees of the barrister, though no longer applicable to those of the doctor—that professional remuneration is a honorarium, or, to descend from the fine Latin word to colloquialism, a tip; it would be surprising if a railway porter reckoned his expectations on the same scale for the first-class and the third-class traveller. Judges have not hitherto rejected the principle that medical fees should be graded according to the patient's income, and they have been known to give definite support to the subsidiary, or perhaps converse, principle that a practitioner living in a district frequented by professional leaders, or where rents and other expenses are heavy, may charge a higher fee than one living in a country village. It may be taken, we think, that, whatever the historical basis for the procedure may be, it is generally conceded that medical fees, in the public and professional interest alike, can be graded in a general way upon the pecuniary position of the patient as judged by his residential status.

But this method of charging is, of course, one of rough justice, and the appearances of material prosperity are often deceptive. Here the practitioner, to the great comfort of both parties, may sometimes be able to have the situation made clear by a mutual arrangement, although this is not as simple an affair in general practice as in consultant work. The fee of the consultant is very usually settled, after an interchange of confidences between the patient and the general practitioner, in the case of a particular service. No such rosy opportunity arises for the family practitioner to arrive at what should be his own charges for general and perhaps prolonged attendance. The specialist can maintain his fixed scale of fees, ascertainable in advance. Like the fashionable advocate in the law-courts, his fee may be high because his services are in high demand, though, unlike the barrister, he cannot manage to attend to several cases simultaneously. The general practitioner is in a different position; his situation indeed must be unique among professional men. He can hardly refuse his services; he can hardly haggle with his patient on the doorstep; and he cannot exactly foresee the nature of the work which he is about to undertake. When it is remembered that the patient ultimately receives an account which comes to him retrospectively as a total of items, neither checked nor agreed, it is significant that the doctor's bill is so seldom questioned.

Are we approaching a change of method? House rentals no longer furnish so good a guide to the assessment of income as in the days when large houses were more readily inhabited. The panel system is gradually accustoming a large proportion of the medical profession to the rigid tariff of scheduled charges. If and when the whole of our population is treated by a State medical service—which some expect and of these some hope—fees will either be standardised or entirely abolished. Meanwhile, in grading his fees according to the capacity to pay, the medical practitioner does but pass on to his patients the system applied to himself as a payer of rates and taxes.

## THE EDUCATION OF THE DEAF IN THE UNITED STATES.

A REPORT of a visit to American schools for the deaf, paid in 1923 by Mr. SIBLEY HAYCOCK, headmaster of the Langside School, at Glasgow, gives valuable information on the subject. It has been published by the National Association for the Oral Instruction of the Deaf, in association with the National College of the Teachers of the Deaf, and should prove of great utility to educational workers along similar lines in this country, for it summarises the position in the States and indicates directions in which advances may be reasonably expected in the future on both sides of the Atlantic. Mr. HAYCOCK gives a general review of the chief features of education of the deaf in the United States, and in places where he has found it impossible to combine a broad view with mention of details he supplies references or addresses so that further information can be obtained from American sources. He points out that, as in America education, general and special alike, is a function of each separate State and not of the Federal Government, many educational units perform their functions through many legislative boards in determining the rules and policy for the training of youth, a fact which renders it hard to justify general statements regarding the education of deaf children as a whole in the United States. All the States in the Union, with the exception of Wyoming, Delaware, Nevada, and New Hampshire maintain, either wholly or partly, residential institutions for the education of the deaf children, while "Gertrude" and her little friends can resort, at the expense of their separate States, to the nearest State-supported schools in their proximity. There are 64 public residential schools, of which 45 are entirely supported by the States in which they are respectively situated, while the remaining 19 are partially subsidised from the funds of the State, or from school fees or voluntary contributions. The State, however, obtains little private relief, for only 11 institutions have fee-paying pupils, while 13 receive partial support from voluntary sources. Here there is room for improvement. When the geographical area and population of the United States are considered, the provision for the education of the deaf subject will not be found very large as far as residential institutions are concerned, but there are 78 public day schools for the deaf in the States, the majority of which are supported either by the State or by the city in which they are to be found, with or without public subsidy, and Mr. HAYCOCK was impressed by the size of some of the institutions. But all with practical experience of imparting instruction to large classes know the difficulty inherent in them, which must be accentuated

when the pupils are not of either normal or comparable standards. There are in America residential schools for the deaf where pupils ranging from 7 years to 23 years, or older, are gathered together under a single roof, and it is obvious that here great changes in the grouping of pupils of such dissimilar age must take place before organisation can be evolved dealing with many of the problems that are presented. It is good to know that more individual and homelike attention is being provided by progressive centres.

The chief support of all the institutions depends upon the "appropriations," as they are styled, and the usual procedure seems for the State Board of Education to obtain a grant by vote of the State legislature, and to apportion the results to the various institutions under its ægis according to the several needs in each category; when, as may well happen, a particular institution does not secure the amount for which it has budgeted a "deficiency appropriation" is provided. This is an excellent method of meeting the financial needs, and it is to be hoped that the principle prevails under which help is given in proportion to the amount of self-help manifested. It would be excellent that similar appeals, partly State and partly popular, were feasible in this country where the need is equally sore. For the similiarity of conditions prevailing in the City of New York and in "County Council London" is brought out by the following comparison: the money appropriated for the education of deaf children attending the New York City day school, taking the average for the two years, April 1st, 1921–March 31st, 1923, works out for 358 pupils at £84 per child per annum; while the cost of educating 340 deaf children at the London County Council day schools during the same two years works out at approximately £80. In both cases an average attendance was assumed, but it must be remembered that a majority of the American States have no compulsory law enforcing the attendance of deaf children at school, while the arrangements in those States where compulsory legislation is in effect are not uniform. Some degree of difficulty in getting the deaf population into school at the desired age appears to be experienced throughout the States, despite the efforts of sympathetic workers, and failure to provide early education for the children is made the subject of some critical remarks. But the report records that every deaf child in the United States is assured of a good elementary education, and further has an opportunity for receiving secondary and even college training when capable of profiting by them. The problem of how to ensure the early education and instruction of these afflicted children remains largely to be dealt with. Pupils who can justly aspire to a college education will find their needs catered for at the Gallaudet College for the Higher Education of the Deaf at Washington, and it is a good testimony to the way in which Mr. HAYCOCK has done his work that the foreword to his book should be a criticism of it from Prof. I. S. FUSFIELD of that College, and editor of the "American Annals of the Deaf." Prof. FUSFIELD finds Mr. HAYCOCK'S report "an open-minded, outspoken review, correctly focused," and recognises that a careful study of it is needed, because "it has sought out the pertinent facts in the American plan, and analysed them constructively."

An epitome of the curriculum for the pupils at Gallaudet, where the students at the time of Mr. HAYCOCK'S visit numbered 134, states that 130 of these were drawn from the residential institutions for the deaf, and represent approximately 3 per cent. of the sum total of pupils of those schools. Applicants for admission are only admitted to the preparatory class when well grounded in elementary studies, especially in mathematics. The charge for board, lodging, and tuition is 500 dollars for the academic year, but there are opportunities for the students to earn part of this money by labour in the College and without—a certain number of the male students, for example, are employed in the printing offices of Washington. A degree is offered to Gallaudet students after three years' study, when it is to be remembered that vocational training receives particular attention. By reason of the longer school period prescribed in America than in England the education of deaf children seems in advance of that point which the education of the English deaf children reaches, and results at the best of the residential schools, especially in the Eastern States, are, age for age, better in America than with us. But Mr. HAYCOCK does not attribute this entirely to the extended period of education or to the longer school hours, but points to the superior organisation of the institutions, their better equipment, and their better staffing. None the less, it appears from other sections of the report that the supply, training, and certification of teachers remain for the American schools, as for ours, a serious problem.

# Annotations.

"Ne quid nimis."

## THE SALE OF PHENOLIC DISINFECTANTS.

THE pharmaceutical press has for some time been exercised over the question of the sale of disinfectants by oilmen, grocers, and similar tradesmen. The qualified pharmacist appears to suffer under a real grievance, which in fact involves the whole question of the use of disinfectants. Why do people use disinfectants? It would probably be difficult to obtain from the average user a clear answer to such a question. There is no doubt a widespread and rather touching faith in the hygienic properties of anything possessing a phenolic or tarry smell. It is, perhaps, on the whole as well that this should be so, but there is some danger that a false sense of security may thereby be engendered and also that the free use of disinfectants may be considered as a substitute for cleanliness. Further, the experience of the past shows that there is definite risk in the unrestricted sale of substances which from their very nature must be more or less poisonous to human beings and domestic animals. This danger has been recognised by the Pharmaceutical Society and the Privy Council, the bodies on whom the legislature has placed the onus of safeguarding the public in such matters. By the Pharmacy Act of 1868 chemists and druggists were given the monopoly of the sale and dispensing of scheduled poisons—a work which, it will be understood, forms but a small part of the practice of the average pharmacist. The addition of substances to the schedule of poisons as occasion might arise was left to the initiative of the Pharmaceutical Society with ratification by the Privy Council. No undue haste appears to have been shown in the matter of the inclusion of carbolic acid since the Pharmaceutical Society, moved thereto by the representations of coroners regarding the alarming number of accidents and suicides, passed the necessary resolution in 1882, and carbolic acid was scheduled in 1900. Many deaths took place in the interval largely due to careless sales. By Orders in Council of Oct. 1st, 1911, and Oct. 12th, 1912, made under the Poisons and Pharmacy Act, 1908, all liquid preparations sold as carbolic, or carbolic acid or carbolic substitutes, or carbolic disinfectant, containing not more than 3 per cent. of phenols shall be labelled "Poisonous—not to be taken," although, unlike stronger preparations, they need not be labelled "Poison," nor is the sale confined to registered pharmacists. This allows a variety of products of no great germicidal value to be sold by whosoever desires so to do. The liberation from German proprietary rights of the word "lysol" in 1914 enabled anyone who wished to apply this name to any product which he felt he could advantageously sell as such. One result is that whilst several firms of repute make, for use by physicians and surgeons and for sale by pharmacists, preparations similar to the original lysol, other preparations are about one-sixteenth its strength. That is, they are sufficiently

weak to be sold by anyone. The following shows that this cannot always be done with impunity. A case heard at Bow-street in 1925 led Mr. Graham Campbell to the decision that by usage of the trade the word "lysol" had come to mean a solution containing 50 per cent. of cresols. Hence he must hold that a false trade description had been applied to the article, and that the article had been sold bearing such false trade description. The defendant company was fined 15 guineas on each summons with 50 guineas costs, and the retailers were treated under the Probation of Offenders Act, only being required to pay 5 guineas costs. It was then suggested by the defence that this action was an attempt by pharmacists to prevent the sale of lysol by grocers.

What, it may be asked, is the proper scope of phenolic disinfectants? There is a definite surgical use for sterilising dental and general surgical instruments, cleansing areas to be treated, wounds, and sponges. For this work lysol is specially convenient owing to its transparency. In addition to metal instruments, rubber gloves and sheets, the walls and floors of operating rooms, and all sorts of things which have been or may have been in contact with patients suffering from infectious disease need actual sterilisation, as do stools, urine, and other emanations of such patients. All these are well-defined medical and surgical requirements for which it is necessary to have a clear notion of the strength and general character of the disinfectant used. Where a patient is not treated at a hospital or clinic, much of the less critical work is necessarily left to the members of the household, who act under the general instructions of the doctor in charge of the case. It is important, therefore, that if he orders a certain material to be used, the description should be sufficiently precise for him to know that it or its equivalent shall be obtained. In addition to these definite uses many people seem to prefer disinfectants to absolute cleanliness, so masking a fetid smell with a phenolic one where the right thing would be to have no smell at all. Public bodies are not exempt from blame in this matter, and although it may be argued that where it is impossible to secure cleanliness disinfection is the next best thing, yet it is difficult to see, in face of the known properties of phenol, that the sprinkling of a little carbolic powder or fluid on a garbage heap will do more than arrest decay on the surfaces actually touched by the disinfectant, whilst the bulk of the material may be fermenting and giving off foul gases and vapours.

Some useful and suggestive work on the composition and properties of a variety of disinfectants, mostly phenolic in character, was published by the Medical and Health Department of Western Australia in 1924. In addition to pure carbolic acid, nine proprietary articles of the lysol group — cresol-soap solutions containing about 50 per cent. of phenols, with one made from 50 per cent. orthocresol and soft soap, four weaker lysol-like preparations, seven emulsified preparations, and four "phenyles" (emulsion-forming preparations of low phenol content, low cost and small bactericidal power)—were examined. Tested against the same strain of colon bacillus in distilled water, the average coefficient of the 50 per cent. lysol type was 2·4, of the weaker "lysols" from 0·2 to 1·6, varying with the proportion of cresol, whilst the emulsions averaged 8·4. The presence of only 3 per cent. of fæces, however, necessitated in all cases an increase in strength of the solutions for the same effect to be produced. Whereas the proportion of carbolic acid had to be raised 1·4 times, the cresol soap solutions needed to be raised 2·4 times, and the emulsions about 8·2 times for the same effect to be produced. These results show that for sterilising clean instruments, or inert things like rubber gloves, dilutions based on the coefficient may be used. But the presence of much organic matter of a kind which may form condensation products with phenols renders it necessary to use much stronger solutions than a consideration of the coefficient would suggest, and incidentally greatly decreases the value of the apparently more active emulsified liquids. These facts make it all the more necessary that a medical man in advising as to the use of disinfectants should not only consider exactly what is appropriate, but should indicate that it *must* be obtained, making it clear that only pharmacists are allowed to sell preparations of the required activity.

## ADMINISTRATION OF VACCINATION.

WE publish in this issue (p. 271) an address by Dr. James Bennett, delivered at the annual general meeting of the Association of Public Vaccinators on Jan. 28th, on his retirement from presidency of the Association. In this address he discusses impending changes in the administration of vaccination, dealing with its anomalous position under the Poor-law and the proposed transfer to the county and borough councils. The pros and cons of this reform are fairly set out, and some of Dr. Bennett's arguments are applicable to different but related problems which are likely to arise out of the Government's new Bill. On the whole he considers that the proposed change would advance the cause of vaccination and improve the position of vaccinators. It should also be welcome, he thinks, to the medical officers of the counties and boroughs, if only because it simplifies the machinery for general vaccination in the face of an epidemic. Dr. Bennett believes it to be very inadvisable, however, that vaccination should become the duty of assistant medical officers of health; pointing out that these officials often hold their posts for only a short time, and cannot get to know families and parents in the way that a public vaccinator should. In the discussion which followed Dr. Bennett's address there was almost unanimous agreement that the change of administration to counties and county boroughs would be in every way desirable, though some speakers expressed the opinion that it would be still more satisfactory to serve directly under the Ministry of Health. There was a strong feeling that fixity of tenure and the question of superannuation should be kept prominently in view during discussions of the Government's Bill.

## REGIONAL DENTAL OFFICERS.

THE Ministry of Health announces the first appointment to the panel of dental surgeons who are to advise approved societies under the National Health Insurance Scheme in their annual allotment of over £2,000,000 for the provision of dental treatment as an additional benefit. This panel will enable the societies to obtain a second opinion as to the need for such treatment, to check estimates of cost received from dentists, and to standardise the materials supplied. There are to be six full-time regional dental officers in England and Wales, who will be stationed at London (2), Birmingham, Manchester, Leeds and Cardiff. The appointments just made are: Mr. H. A. Mahony (Principal Regional Dental Officer) and Mr. Arthur Taylor in London; Mr. J. Woodford-Williams in Cardiff; Mr. H. G. H. Cowell and Mr. T. Dilks Page. One other appointment has yet to be made. The cost of the service is to be met out of the funds of approved societies providing dental benefit under the new arrangements, which have been agreed upon between representatives of the societies and the dental profession.

## THE FINGER-PRINTS OF IDENTICAL TWINS.

A NOTE in our columns on Dec. 25th, 1926, referred to an interesting paper by Dr. G. P. Crowden, published in the Guy's Hospital Reports the previous October, and drawing attention to the remarkable similarity in physical make-up and mental development which characterised a pair of male twins who had come under detailed investigation. Their size,

shape, appearance, rate of growth, finger-prints, differential blood counts, illnesses, scholastic records, mental characteristics, muscular power, and all measurable qualities were compared, and a remarkable degree of resemblance was revealed. The similarity of twins may lead in real life to many embarrassing and even sensational situations, while since the days of Terence it has furnished material for the plots of dramatists and story-tellers; it is a subject, therefore, which always leads to general discussion. This has occurred in respect of Dr. Crowden's twins, and our reference to the resemblance of their finger-prints has been translated by the press into a statement of absolute identity. Dactylography is such a powerful weapon in legal hands, that the Commissioner of Police of the metropolis has received inquiries from finger-print experts all over the world, calling attention to the statement in various newspapers, that the finger-prints of these twins had been found to be identical, and asking for particulars. As a result the Commissioner has replied to these inquiries by pointing out that the finger-prints of these twins are not identical, and, further, that Dr. Crowden had never made any assertion to that effect, contenting himself (as in our columns) with stating that they were "very much alike." Reproductions of the impressions have been obtained by New Scotland Yard and examined, with the result that the ridge characteristic data disclosed were found to be absolutely dissimilar. The estimation of finger-prints is a very exact procedure, and it is clear that a superficial resemblance may conceal fundamental variations.

## DIURNAL TIDES OF LEUCOCYTES.

IN his *Ars Anatomica* of 1714 the ingenious Dr. Salmon engages in a discussion of the rate of the circulation in man. Perceiving that he can obtain his answer if he knows the blood volume, cardiac output, and pulse-rate, he calculates that a man has (in modern measures) about 11 litres of blood, and that the left ventricle expels about ¾ c.cm. at each systole, and observes with his minute watch that the heart beats about 60 times a minute. Whence he deduces that all the blood in the body goes round once in about four hours. Horrified at such a violent and extravagant motion, he concludes by satisfying himself that it is much more agreeable both to nature and reason to believe that the blood ebbs and flows in harmony with the sea, and circulates twice every 24 hours. We know now that it goes round once a minute, or rather faster, when the body is at rest, but this naïve confidence in the harmony of man with all nature is recalled by an interesting study of the fluctuations in the number of leucocytes in the blood by Dr. A. F. Bernard Shaw, of Newcastle, which appears in the current number of the *Journal of Pathology and Bacteriology*. Dr. Shaw finds that the total leucocyte count may vary by 1000 or 2000 at short intervals—15 minutes or even less—and that these small oscillations are imposed on two main tidal waves, one reaching its maximum in the afternoon, the other soon after midnight. These changes are due to fluctuations in the number of neutrophile cells, and the lymphocytes and other varieties are not involved; he also produces evidence that the leucocytes are uniformly distributed in the peripheral and central circulations. What is more surprising, however, is the discovery that the day and night tides occur regardless of food, exercise, and sleep, which have no clear influence on them; nor are the curves of leucocytes synchronous with the daily curve of body temperature. It is shown once more that "digestion leucocytosis" is imaginary, and we hope that myth is now exploded for good. But the leucocyte tides are left in a mysterious state, and it still seems likely that the apparent independence of food and sleep would disappear with a longer trial of an inverted mode of life. It takes time for cells to multiply and grow, and rhythmical habits impressed on tissues by immemorial rhythms of personal and ancestral conformity with the clock may well last through the trivial irregularities introduced by experiment.

## THE WEBER COLLECTION.

THE first two volumes of the great collection of Greek coins formed by the late Sir Hermann Weber, M.D., were reviewed in THE LANCET on their appearance.[1] The first part of the text of Mr. Forrer's third volume[2] has now appeared, together with a portfolio of plates to illustrate the whole volume. The coins dealt with in this portion (Nos. 4744 to 6967) are those of the seaboard countries of Asia Minor from the Bosporus to Lydia, and they are illustrated on Plates 172-247. We have already mentioned the fact that by means of a special grant from the Treasury, many of the most noteworthy coins in the Collection have been acquired for the British Museum. This provision has been supplemented by a grant from the National Art Collections Fund, by the generosity of private individuals, and not least by the generous opportunities for pre-emption offered by Messrs. Spink and Son. The extent to which the National Collection has been enriched can nowhere be better illustrated than from this section of the catalogue. Among the most beautiful of ancient Greek coins are the rare gold staters, dating from the early fourth century B.C., of the celebrated Hellespontine city of Lampsacus. The Weber Collection contained no less than nine of these staters, of which two are unique, two known only by one other specimen of each, and a fifth known only by two other specimens. All five coins are now in the British Museum, including a remarkable coin which has for type a Nike sacrificing a ram.

Farther along the coast of the Propontis was another of the big coin-producing cities of antiquity, the town of Cyzicus, whose electrum staters took the place of an international gold currency during the centuries before Philip of Macedon opened the Pangæan gold mines, and Alexander the Great after him sent the great stores of gold from his Eastern conquests into currency. This electrum is a natural alloy of gold and silver washed down by the great rivers of Asia Minor, and it was in this metal that the peoples of the Ionic seaboard first coined money, probably ca. 750 B.C. Many of the cities of this part of the world have primitive coins of electrum, and in some places the use of the metal persists, although silver may also have become available. The Cyzicene staters are much sought after by the collector, and it is surprising to find as many as 41 in the Weber Collection. Many of these derive from famous collections of the last century, including those of Lord Ashburnham and Canon Greenwell. Other electrum coins here represented are those of Phocæa, the small unidentified early coins of the cities of Ionia, the pretty one-sixth stater pieces of Lesbos, and two of the electrum staters which in recent years Prof. P. Gardner has identified as the coinage of the towns leagued together in the Ionian revolt against Persia at the end of the sixth century B.C. A later example of a presumed federal or alliance coinage is perhaps to be found in two examples at Ephesus of the very rare coins issued about 390 B.C. by Ephesus, Rhodes, Cnidus, Iasus and Samos. These coins bear a common type, the infant Herakles strangling the two serpents, but if thereby an alliance is denoted no literary record of the event has survived. Among other coins of outstanding interest are a unique tetradrachm of Smyrna of the fourth century B.C. well known from previous publications, a superb tetradrachm of Cnidus, two fine tetradrachms of Cos, and a very fine and rare stater of Amastris. These coins are now all in the British Museum, the coin of Cnidus being a contribution from the National Arts Collection Fund. Many of the cities

[1] THE LANCET, 1923, i., 199; and 1925, i., 665.

[2] The Weber Collection. Vol. iii., Part 1, Asia, Bosporus, Colchis, Pontus, Paphlagonia, Bithynia, Mysia, Troas, Aeolis, Lesbos, Ionia, Caria, Lydia. By L. Forrer. London: Spink and Son. 1926. Pp. 473. With portfolio of 136 plates. £4 4s.

where the coinage is less spectacular are well represented, and there are many varieties, new or not well-known, of the later imperial coinage of the Greek towns when under the rule of the Roman Emperors. It remains to add that Mr. Forrer has performed his pleasant task with the thoroughness and care which marked the earlier volumes.

## DIAPHRAGMATIC HERNIA.

HERNIA through the diaphragm was known as long ago as the days of Ambroise Paré. At the autopsy on an officer who died in great pain eight months after a bullet wound, Paré found a large distended loop of the colon in the thoracic cavity; the hole by which it had entered was, he tells us, too small to admit the little finger. For many decades, however, the condition remained a mere curiosity of the dissecting-table. Now and again a writer would describe it, and suggest such remedies as bandaging and blistering. Bowditch and Péan, in 1865 and 1880 respectively, justified operation as a last resort, but on the whole the condition received little attention until the late war, when the daily occurrence of cases similar to Paré's brought it into prominence and enabled it to be studied exhaustively. Moreover, the use of X-rays revealed a group of herniæ that were congenital and not traumatic at all, and a whole series that would never have been discovered, because of the absence of strangulation. Dr. Jean Quénu,[1] in a recent summary of the subject to which he contributes much first-hand information, gives an idea of the frequency of diaphragmatic hernia when he states that there are now over 1500 cases in the literature. He classifies it as congenital and traumatic. The congenital form is due to a failure of the two parts of the diaphragm to meet properly, and so nearly always occurs posterolaterally. It is much more common on the left side, probably because the liver protects the right cupola, whereas the stomach exerts heavy pressure on the left. Traumatic herniæ, which are always left-sided, are generally the result of stabbing or shooting wounds. Often the hernia is not immediate but takes place some time afterwards, when a blow or violent effort forces the weak barrier of the healed scar. Nevertheless, Dr. Quénu holds that many so-called secondary herniæ are really primary ones which have been neglected. A congenital hernia, he finds, nearly always involves the stomach, the transverse colon and the great omentum, and sometimes takes in parts of the small intestine, cæcum, liver, and pancreas. The organs are, as a rule, free from attachment to the thoracic cavity and are easy to withdraw, but sometimes, when an old traumatic hernia has coincided with a more or less septic hæmothorax, there are very intractable adhesions. The great omentum may form a false sac over the intruding mass. The true sac is very rare and is hardly ever seen except in "fœtal" herniæ—i.e., those developed later in the intra-uterine life than the congenital or embryonic herniæ. It is easy to realise that strangulation at the point of rupture may cause very severe lesions, such as perforation, with an escape of gastric or intestinal contents into the pleural cavity.

According to Dr. Quénu, the symptoms of a large hernia involving both stomach and colon are those of acute gastric, intestinal, or cardio-pulmonary disturbances, always accentuated by meals. Signs of displacement are sometimes fairly obvious and sometimes elusive; they vary in different patients, and in the same patient from time to time, and alter with changes of position or the presence of food in the alimentary tract. Radiography often makes diagnosis a simple matter, and the hernia can sometimes not only be seen but be accurately measured; some cases, however, simulate diverticulum of the œsophagus or an abnormally high cupola of the diaphragm. The former are generally exposed by watching the way in which the pocket fills and empties, and by the presence of the shadow of a normal stomach underneath. The latter may offer some difficulty, especially when the diaphragmatic condition is of the kind described by J.-L. Petit in 1780 as "eventration," when the diaphragm undergoes distension at one point and is pushed upwards into the pleura in the shape of a deep, narrow dome. When this has happened, the resulting photograph is practically identical with one of a hernia. Dr. Quénu recounts various ways of making the diaphragm cast a clearer shadow and reveal its position, and correctness of diagnosis is important in that, whereas hernia demands operation, eventration is generally better left alone.

The treatment varies according to whether the hernia is a traumatic or strangulated one requiring immediate operation, or one which can be dealt with at a chosen time. Dr. Quénu describes as the typical operation one which begins with an exploratory incision in an intercostal space, varying from the sixth to the tenth according to the site of the rupture. The aperture is prolonged through the abdominal wall to the middle line, opening all the soft parts and the peritoneum. An incision is then made through the costal cartilage and the diaphragm to the site of the hernia. Adhesions are freed and the ectopic organs withdrawn. The orifice is obliterated and the diaphragm sewn up at different points as far as the chondral attachments. In closing the thorax, the intrapleural air is exhausted with a syringe. The pneumothorax produced by the operation has never been known to have ill-effects, and the diaphragm heals extremely well. If much of its substance has to be removed, there are several ways of filling the gap. Different operators have used the stomach, a piece of omentum, the left lobe of the liver, a lung, or a graft of muscle from the abdominal wall. Dr. Quénu suggests that a free graft of aponeurosis might be the most satisfactory method, but it has not yet been tried. Operation for strangulated diaphragmatic hernia is an emergency, and the condition is very grave indeed, but the method described allows the patient the most reasonable chance of recovery.

[1] Arch. Med.-Chir. de l'App. Resp., 1926, i., 356.

## RENAL DWARFISM.

IT is mainly owing to Dr. H. Barber, who published[1] the first three cases of his remarkable series in 1913, that the rare condition known as renal dwarfism has been rescued from the limbo of "late rickets" and recognised as a separate entity. Its importance lies in the invariably fatal results that follow operative treatment of the deformities associated with it. The fundamental pathology consists of an extreme degree of chronic interstitial nephritis, unaccompanied by œdema, and with little or no cardiovascular hypertrophy. In the later stages calcification at the epiphyses becomes very deficient and deformity commonly follows. Great stunting of growth is a feature in all cases, and girls are affected rather more often than boys. The renal symptoms appear insidiously in early childhood with thirst and polyuria and may pass unrecognised by the parents, but gradually attacks of drowsiness, headache, and vomiting supervene, and death in uræmia occurs on the average about the twelfth year. Deformity is present in some 70 per cent. of cases and may come on before the symptoms of renal disease are noticed. The type varies with the age of onset. Before the age of nine it takes the form of slipping and displacement of the epiphysis on the diaphysis. The lesions are painless. They affect mainly the knees and wrists, but frequently the ankles and shoulders as well, and cause great disability. Radiographically the appearance is striking and distinctive. After the age of nine separation of epiphyses does not occur, and the deformities cannot be distinguished from those of so-called late rickets. Genu valgum is by far the most common deformity in this type of case. The diagnosis is usually easy if the condition is borne in mind, and

[1] Brit. Med. Jour., 1913, ii., 1204.

depends on the recognition of the underlying nephritis. A constant specific gravity of the urine with high blood-urea and a diminished power of excreting dyes and urea are characteristic. Albuminuria alone cannot be implicitly relied upon as a sign, and may be very slight. Recently Dr. F. W. Lathrop [1] has published a typical case of that type of renal dwarfism in which the deformity arises early in the second decade. His paper is of special interest because of the very complete analysis of the blood which he records and the number of interesting biochemical problems raised in his commentary on the case. In addition to severe acidosis and nitrogen-retention, phosphorus was present in the blood in roughly double its normal amount, whilst calcium was found in just over half its usual quantity, the deficiency being at the expense of the combined or un-ionised form. These changes are similar to those found in advanced renal inefficiency in adults, but it is suggested that when they occur in children before the epiphyses have united they cause failure of calcification at the epiphyses and consequently dwarfing and deformity. This seems very probable. It would be interesting to know whether the change in calcium and phosphorus values coincides with the onset of deformity. The fact that in nearly every recorded case the deformity has been followed by death in less than two years suggests that it occurs only in the advanced stages of the disease when such changes in the calcium and phosphorus values would be present. The absence of tetany in spite of such a deficiency of calcium is attributed to the fact that the normal amount of ionised calcium was maintained. Dr. Lathrop regards those cases in which deformity occurs in early childhood as an "allied condition." Probably there is no essential distinction, and the age of onset of deformity is determined by the rate of progress of the renal condition.

## THE MEDICAL SERVICE OF CHINESE ARMIES.

Dr. C. M. Oman, a captain in the Medical Corps of the U.S. Navy, who has spent the last two and a half years in Pekin, has given his impressions of the medical service of Chinese armies in the *Military Surgeon* for January. He writes from an experience of the treatment of 5000 military casualties. There is, he says, medical organisation of a sort; it was laid down for the Chinese Army in 1912, when the Pekin Army Medical College was established to provide trained medical officers. Theoretical instruction has been given, but there seems to have been no dissection, no laboratory work, and little or no clinical work attached to it. These officers are available to help the Chinese army, but there is no Chinese army at present. There are many armies, numbering in all about 1½ million, who billet themselves on the inhabitants. They have no hygiene as we understand it, no purified water, no isolation for infectious diseases, no latrines, no anti-tetanic serum. There is in China no tradition inculcating care of sick or wounded. There are few trained surgeons, probably not 30 in all China, able to do abdominal work. Dr. Oman once found a force of 18,000 men with but one medical officer, and he with no effective orderlies or nurses, no instruments but his own, no operating room or X ray outfit, no prearranged transport for his wounded. The Chinese have become accustomed to trusting to the humanity of foreign medical agencies for the care of their wounded. Dr. Oman tells of a battle near Tientsin in 1925, when the best Chinese army—that of Feng Yu Hsiang—left its wounded to find their way to Pekin, 70 miles away. They began to arrive in a couple of days, and soon there were some 2000 to be cared for. As no Chinese came forward, the Pekin Union Medical College, foreign doctors and laymen, equipped and staffed a casualty hospital. This situation repeated itself a few months later, and the Kuominchun army paid nothing for the help thus afforded. But there is some evidence of a changing outlook. The *World's Health* for November last tells of the spread of nursing education in China under the International Red Cross, and its almanac asserts that many wounded men have been cared for in the four Red Cross hospitals in Shanghai. Shanghai is also the centre of an active health propaganda, of which Dr. W. W. Peter's pictures are the most telling feature.

[1] Arch. Int. Med., 1926, vol. xxxviii., No. 5, p. 612.

## POTENTIAL REDUCTION OF CANCER MORTALITY.

To a recent meeting of the Section of Epidemiology of the Royal Society of Medicine, Prof. Major Greenwood and Dr. Janet Lane-Claypon contributed a paper on the possibility of reducing the present mortality from cancer of the breast and uterus. The views advanced were based on results obtainable with present methods of treatment, and did not take into account any reduction already effected by operative procedures. In the first place, Dr. Greenwood and Dr. Lane-Claypon took out the age-distribution of the registered deaths from cancer of the breast and uterus, and compared them with the age-distribution of hospital applicants for treatment who were suffering from these diseases. The figures for the mortality-rates for this country at the different age-periods were taken from those prepared for and published by the League of Nations. It was found that whereas 24 per cent. of all deaths from cancer of the breast occurred among women over the age of 70, and 46·7 per cent. over the age of 60, the percentages of applicants of those ages compared with the total number of patients were 2·8 and 17·6 respectively. Hence, although the mortality-rates are high at the extreme of life, the number of applicants for treatment is small. Similarly, although the mortality from cancer of the uterus in these two age-periods was 14·4 per cent. and 37·8 per cent. of the whole mortality from this disease, the numbers of hospital applicants of these ages were only 2·1 per cent. and 17·1 per cent. of the total numbers. In order not to over-estimate the possibilities it was assumed that no reduction in mortality can be effected among women over the age of 70, a supposition which errs on the safe side. Figures prepared in part from the literature and in part from data specially obtained from hospitals in this country, showed that youth does not offer any disability as to results of operation. This being so, it may be assumed that all women under the age of 70 are equally capable of being treated successfully, and hence, theoretically, about 75 per cent. of patients suffering from cancer of the breast and 85·6 per cent. of those suffering from cancer of the uterus are capable of receiving such benefit as is offered by present treatments. Dr. Greenwood and Dr. Lane-Claypon stated that not more than 50 per cent. of all women dying of cancer of the breast can be found to have made any application for effective treatment—i.e., treatment of a nature likely to secure permanent removal of the disease. The corresponding figure for cancer of the uterus is not as yet available, but is believed to be rather worse. The Leeds statistics already published show that if radical operation is undertaken at a stage of the disease when the growth is still confined to the breast, 80 per cent. of the patients are alive ten years or more after operation. After further analysis and comparison of the above data, Dr. Greenwood and Dr. Lane-Claypon concluded that a 50 per cent. reduction in the mortality from cancer of the breast could be achieved with present methods if all women would attend for radical operation at an early stage of the disease. Similar results could be obtained with cancer of the uterus. At the present time, they state, the condition of little more than half of all the applicants for treatment is operable, and in many of these the disease is in an advanced stage. The present operative mortality-rate for all cases may be taken at about 17·3 per cent., and the survival-rate at 10 years at about 32·6 per cent. of all cases operated. If the patients were all in the early stage of the disease, the operative mortality would be reduced, and at the same time the survival-rate would

rise. The improvement from these causes, it is believed, would be almost certainly not less than 17·3 per cent., so that the survival-rate would reach 50 per cent. of all cases. As 85·6 per cent. of those who die at all ages from this trouble are capable of being operated on if they could be persuaded to attend early for treatment, it follows on this calculation that not less than 42 per cent. reduction could be secured among those who at present die from cancer of the uterus. Dr. Greenwood and Dr. Lane-Claypon pointed out that the data available for this country show that the mean period elapsing after the patient has become aware of her symptoms is from 8 to 12 months for cancer of the breast (according as the cases of long duration are or are not included) and from 6 to 9 months for cancer of the uterus. Hence, although a small proportion of women may be unaware of their trouble until the disease has passed its early stages, it is at least certain that in both forms of cancer there is great unnecessary delay in making application for treatment. The view that a reduction of approximately 50 per cent. could be effected has been confirmed statistically by calculations based on the survivals among known cases. In the course of the subsequent discussion, Sir James Berry and Mr. W. Sampson Handley strongly emphasised the supreme importance of early treatment.

## THE LAW AND TRADITION OF MEDICAL PRACTICE.

MR. W. SANDERSON and Mr. E. B. A. Rayner, both barristers-at-law, have written an interesting introduction to a complete work[1] on the law and tradition of medical practice, the projected volume being "a treatise on the rights and duties of physicians, surgeons and dentists, with a complete description of the status of apothecaries and midwives." The work contemplated will thus cover an enormous field, while the introduction deals with little more than general principles, omitting, further, any mention of public health or forensic medicine, because, as is pointed out, both subjects, while extending over a wide field of law, are adequately dealt with in existing text-books. The authors' description of the contact of medicine and law—that is the relation of medicine to the body politic will make useful reading to every medical practitioner. We are all supposed to know the law—that is to say, to be aware of the rules that govern this relationship; but while many other citizens can ascertain with fair facility where they stand in regard to particular enactments, in no class, except among lawyers themselves, is professional routine so perpetually in touch with various general and special regulations. Our pages, under the head of "Medicine and the Law," testify to the wide range of questions which fall under this title, and not a little to the presence of anomalies in administration. The statements in this small book upon tradition and custom, as those upon salaries and fees, contain much information that will enable the reader to understand sociological principles as applied to the conduct of medical practice; it is pleasing to find the arguments developed on which the views are founded that the law is still developing in the wake of medical tradition, and that "the striking harmony between medicine and the body politic has been produced by the high standards of honour and service continuously exhibited by the medical profession, and has been as continuously fostered by the law under the guidance of the judges." The warning against the thoughtless granting by medical men of press interviews is scathing, and we are not surprised to learn that the terms employed should have led to a protest from the Institute of Journalists, nor that the authors should have signified willingness to modify the offending passage. That mischievous or troublesome results have followed upon press interviews granted by doctors cannot be denied, and the annals of the General Medical Council can be quoted in support of this statement; but the inclusive indictment of all press reporters cannot be justified by facts.

[1] An Introduction to the Law and Tradition of Medical Practice. By William Sanderson, M.A., LL.B., of the Inner Temple, and E. B. A. Rayner, B.A., LL.B., of Gray's Inn, Barrister-at-law. London: H. K. Lewis and Co., Ltd. 1926. Pp. 77. 7s. 6d.

THERE has been definite improvement in Sir Ernest Hodder-Williams's condition generally during the past week.

THE death occurred on Jan. 25th, at the age of 69, of Dr. Thomas Robert Bradshaw, consulting physician to the Liverpool Royal Infirmary.

Sir Berkeley Moynihan, President of the Royal College of Surgeons of England, will deliver the Hunterian Oration in the Theatre of the College on Monday, Feb. 14th, at 4 P.M. Fellows and Members who wish to be present are asked to apply to the Secretary for cards of admission.

WE publish in another column a letter from a small committee of friends and admirers of the late Sir. Clifford Allbutt, who have decided to erect at Papworth two cottages with which his name will be associated, which are to be used for the accommodation of men disabled by tuberculosis. The inmates will be selected from among those who are unable to support themselves and families, and the association of Sir Clifford Allbutt's name with such beneficent work is very fitting, for he was deeply interested in the work of the colony from its outset. We are sure that many of our readers will welcome the opportunity of helping the good work, while testifying their appreciation of the career of a great leader; this they can do by sending donations to the fund directed to Mrs. Marcus Dimsdale, Papworth Hall, Cambridge.

Mr. J. Hugh Jones, who died on Monday of influenzal pneumonia, was a benefactor of metropolitan hospitals, for it was owing to his imagination and enterprise that the scheme for providing wireless to every hospital bed was successfully realised. The money, collected through the columns of the *Daily News*, exceeded £34,000, which was sufficient to equip 15,781 beds in 122 hospitals, leaving something over for Borstal schools and lighthouses. At a crucial time in his early life—as he told the subscribers to the fund when accepting a presentation—he received kindness from a Manchester hospital, and formed a resolution that if ever he grew up he would endeavour to do something for hospitals to mark his gratitude. Mr. Jones was clear-sighted enough to look upon broadcasting as an ally and not as a menace to newspaper production.

ROYAL SANITARY INSTITUTE.—A Sessional Meeting is to be held at 90, Buckingham Palace-road, London, S.W. 1, on Tuesday, Feb. 15th, at 5.30 P.M., when a discussion on Immunisation Against Diphtheria will be opened by Dr. William Robertson, medical officer of health for Edinburgh. The chair will be taken by Sir Arthur Newsholme.

CONTAMINATION OF MILK.—At a conference of 149 local authorities, held at Leeds on Jan. 27th, to consider the requirements of the Milk and Dairies Order of 1926, Dr. J. R. Kaye, medical officer of health for the West Riding, said: "In 42 per cent. of the examples of milk we recently took we found liquid manure. . . . If a farmer does not supply pure milk," he went on, "he is not an honest man and ought not to be a churchwarden. If I were a coroner I should want an inquest on every child under 12 who died from intestinal trouble. I should look to milk first for the cause of death, and if I found it there I think I could win the day against the producer before a court and a sensible jury. . . . We have been too soft-hearted in the past. A great deal is being done by some producers, but why should not Grade A be the standard milk? There should be a defined standard, and we ought to get real help from the magistrates instead of tinkering fines that are no use whatever."

# Modern Technique in Treatment.

*A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.*

## CCIX.—TREATMENT OF UNUNITED FRACTURES.

### II. SPECIAL FRACTURES.

LAST week the general principles governing the treatment of ununited fractures were summarised, special stress being laid on recognition of the fact that the success of any method depends entirely on the production by the body of callus which is adequate in quantity and in density; failing this, no mechanical device will long resist severe external stress, such as the effects of gravity, or powerful muscle contractions.

Each bone is apt to present certain special features which demand brief reference.

#### *The Humerus.*

(*a*) When the gap between the ends of an ununited fracture of the humerus is only a moderate one, it is best to shorten the arm by rawing the bone ends and cutting each in the form of a step so that they fit together.

The contact can be maintained accurately for a time by drilling the ends and anchoring them together with strong catgut. This prevents displacement during the application of a plaster-splint; such a splint is necessary, since even stout wire may cut its way through the bone and fail to keep the alignment correct long enough for callus to form. The plaster should fix the elbow by including the forearm, and also the shoulder, and to do this comfortably it should take its bearing from the pelvis and lower ribs.

If the upper fragment is short—i.e., ending above the insertion of the deltoid—the arm should be put up in full abduction, but at lower levels any angle which is wide enough to permit comfortable application of the plaster is sufficient.

(*b*) If the gap between the ends of the humerus is so great that an attempt to secure end-to-end union would shorten the arm unduly—e.g., more than two inches—then it is best filled by a heavy graft from the crest of the tibia.

As there is a great leverage on such a graft, once the plaster has been removed, it is usually best to apply it in the form of two parallel struts, one lying for about one inch or more on the surface of each fragment, which has been rawed to receive it, and the second wedged into the medullary cavity of each end. This is one of the exceptions to the rule that intramedullary grafts are bad, for in this case the central graft is only expected to fulfil a mechanical function in steadying the fragments, while the inlay graft and the rawed cancellous bone produce callus. The ultimate absorption of the central graft is thus immaterial. Once the graft is driven into each medullary cavity, a little coaxing being required to get it into the second end, it holds itself; the inlay graft needs fixing either by ligatures of strong catgut encircling the shaft, or by sutures through the periosteum.

Immediately after the operation a plaster support should be applied. If it is well reinforced in the axilla it is possible later to cut a large lid out of the upper arm portion, and through the window so formed the stitches can be removed, while massage can be given to the limb and the muscles stimulated to contract in order to improve the nutrition of the graft without putting any strain upon it. Later the forearm also can be freed and some voluntary movements of shoulder and elbow permitted before the full range is allowed. An alternative to the plaster splint is the so-called "aeroplane" one, made of light metal struts, taking their bearing on chest and pelvis, keeping the shoulder abducted, and allowing traction from the elbow.

#### *Radius.*

(*a*) Ununited fractures of the neck of the radius, in which the head is displaced, and there is disability in connexion with rotation of the forearm, or use of the elbow, are best treated by excision of the head through a small incision over its posterior aspect. Care must be taken not to injure the posterior interosseus nerve in its course round the outer aspect of the bone, and not to leave any raw bone, which might produce spurs and so again interfere with joint movement. No splint is necessary after operation.

(*b*) An ununited fracture of the shaft of the radius is likely to be a very disabling condition, as the carpus works almost entirely on the radius.

A short gap is best bridged, after each end has been rawed, by a thin sliver-graft, which is easily cut from the surface of the longer fragment by a wide gouge, for the bone is light and vascular; such a graft, attached by catgut ligatures to a rawed surface on each fragment, usually causes a rapid production of callus, in which the normal architecture of the bone is quickly reproduced.

Where the gap is a long one such a light graft would be inadequate to stand the strain, and a heavy one from the front of the tibia should be used, applied similarly, and, as union at the areas of contact is rapid, although the part between may be very slow to become vascularised, it is likely to be sufficiently strong to stand the leverage of the hand until this occurs.

When a long gap in the radius is associated with much destruction and fibrosis of the soft parts, a tibial graft would have very little chance of surviving, since the thin skin of the scarred area is likely to slough over it; therefore, in such a case, it is best to shorten the ulna so as to reduce the gap completely, or at least almost so. This should be done at one session, the radius being rawed and, if necessary, grafted at a subsequent operation, after the ulna is again united and available as a splint to the other bone.

Fractures of the shaft of the radius are best approached from the dorsum of the forearm on one side of the radial extensors of the carpus.

#### *Ulna.*

Ununited fractures of the ulna in its lower third may give no disability at all, in which case they should be left alone.

In the upper third they are likely to be troublesome to manual workers from interference with the action of the triceps. When such a fracture is explored it is usual to find the ends of the bone sclerosed and avascular for some distance, so that a light sliding graft is unlikely to result in union. A tibial graft with wide attachment to each fragment should be tried, but even this may gradually atrophy and break at the level of the gap.

It is not desirable to interfere with the radius, whose integrity is vital to the use of the hand.

#### *Carpal Scaphoid.*

A recent discussion of the British Orthopædic Association revealed considerable divergence of opinion as to the correct treatment of ununited fractures of the carpal scaphoid.

Statistics showed that in many cases such a fracture caused no disability in a manual worker, while, curiously, others with an apparently identical injury were totally incapacitated from work. The former group obviously needs no treatment; the latter is usually benefited by excision of the scaphoid. There was a division of opinion among the surgeons as to whether it was sufficient to remove half the scaphoid or whether it was preferable to remove the whole bone and also the semilunar, so as to allow the os magnum to telescope back into the proximal carpal row. The latter procedure has given very satisfactory results in the hands of those who have used it.

#### *Femur.*

Formerly subcapital fractures of the *neck of the femur* were expected to result in non-union, but the pioneer work of Royal Whitman has demonstrated that this should be the exception, not the rule.

Although in these fractures the isolated head of the femur is cut off from its main blood-supply, its capsular attachments, yet if reduction is adequate, so that the neck comes into firm contact with the raw area on the head, then good union will occur in a majority of cases, even in the very old. Such reduction can only be obtained under anæsthesia, and it must be followed by adequate, prolonged fixation. Whitman's own method is by a long plaster spica, reaching from the thorax to the toes, with the hip in full abduction, extension and some internal rotation. This allows frequent turning of the patient—e.g., for an

hour twice a day, so as to diminish the risk of bedsores, and also allows him to be got up in a chair at the end of the first week. The long is preferable to the short spica, which, to be efficient, has to include both thighs, for these elderly patients are apt to be the subjects of chronic rheumatism, so that it is undesirable to fix the good hip, lest it should stiffen. A useful alternative is the Balkan-frame with a series of pulleys and with traction both in the transverse and long axes of the limb.

Non-union in fractures of the *shaft of the femur* is generally due to the interposition of muscle between the ends, and when this has been removed by operation and the ends rawed, further interference is usually unnecessary.

Where an actual gap is present similar methods to those which have been described in connexion with fracture of the humerus are applicable, only it must be remembered that in the lower limb shortening is most undesirable.

*Patella.*

Transverse fractures of the patella commonly result in fibrous union, owing to the intervention of fringes of torn quadriceps tendon between the fragments. The fibrous tissue is likely to stretch and leave the knee weak, so that open operation is indicated, unless the patient's general condition is very unfavourable.

All that is necessary is to free the bone edges, raw them and then fix them together by strong catgut sutures through the quadriceps expansion. Provided that the knee is splinted in extension until bony union is shown by X rays to have occurred, it is unnecessary to use wire to fix the fragments. Massage can be given early if a plaster splint is bivalved, or a Thomas knee-splint used.

*Tibia and Fibula.*

As the *tibia* is splinted to a certain extent by the fibula, it is often sufficient in treating an ununited fracture in this bone to slide down a graft of moderate thickness from its upper fragment, a groove having been made on the front of the lower fragment to receive it.

A number of ununited fractures of the *fibula* give no disability, the functional result depending partly on the extent to which the fragments are firmly anchored by scar tissue, and partly on the nearness of the fracture to the ankle. If weight-bearing is interfered with the bone should be grafted, which is readily done by an inlay graft from the tibia on the same side.

*Large Gaps in Bone after Removal of Tumours and Cysts.*

Spontaneous fractures due to the presence of a tumour or a cyst must be treated by operation whenever possible, for though they sometimes unite again spontaneously, they are very apt to refracture in the future, possibly on more than one occasion.

The first stage in treatment then is radical removal of the cyst or tumour. In the case of secondary carcinoma in a bone operation is rarely indicated, as the patient's general debility or the primary growth overshadow the local bone condition. Even without operation quite a number of these case unite spontaneously when treated like any ordinary fracture. Naturally they tend to refracture, or else some other bone gives way next time.

The innocent tumours which are amenable to removal usually leave a large deficiency in the bone, or at best an egg-shell cavity, which will not stand normal strains, so that a grafting operation is necessary. Such a cavity can be filled with chip grafts from some vascular bone like the iliac crest. Such chips are not good when surrounded by soft parts, as they are apt to become embedded in a mass of fibrous tissue, which does not make the shaft of a bone firm, but they do well when implanted in a rigid cavity. If no shell remains after removal of the tumour, then one or more heavy grafts must be used to bridge the gap.

It has been impossible here to give more than the merest outline sketch of such a complex subject as the treatment of ununited fractures.

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# Special Articles.

## ON THE NATURE OF THE PARENT SUBSTANCE OF VITAMIN D.

BY O. ROSENHEIM AND T. A. WEBSTER.
(*From the National Institute for Medical Research, London.*)

IN THE LANCET of May 16th, 1925, we gave a short account of work we had carried out showing that cholesterol, having the characteristics then known of the "chemically pure" substance, was rendered antirachitic by exposure to ultra-violet light.[1] This fact was also discovered independently and at about the same time by the American observers Steenbock and Black,[2] and Hess, Weinstock, and Helman.[3]

Although this discovery has since been confirmed and accepted by numerous investigators in many countries, and has found practical application for the cure of rickets in children, we were able to show recently [4] that cholesterol when purified still further by a chemical method had lost the property of becoming antirachitic by irradiation.

*Further Work on Cholesterol Derivatives.*

The considerations which led us to this result were the outcome of work undertaken for the purpose of isolating the active substance and of determining the nature of the molecular groupings essential for the successful activation of cholesterol.[5] We succeeded in obtaining from irradiated cholesterol, by the use of digitonin, a substance which was intensely active, but were unable to convert more than about 1/10 per cent. of the cholesterol into this active substance. The investigation of a series of suitably selected derivatives of cholesterol led us to the conclusion that, unless both the unsaturated linkage and the hydroxyl group of the cholesterol molecule were intact, the substance could not be activated. In this part of the investigation the fact that the esters of cholesterol could be rendered antirachitic presented a difficulty in accepting the above conclusion unreservedly.

In continuation of this work, carried out partly in collaboration with Prof. Windaus (Göttingen) and published elsewhere,[6] we were able to offer a solution for these difficulties, and to prove conclusively that cholesterol purified by way of the dibromide cannot be activated by ultra-violet light, and no longer possesses the absorption spectrum in the ultra-violet region which had been considered characteristic for cholesterol.[7 8]

These facts threw new light on the photo-chemical formation of vitamin D. It became evident that the precursor of vitamin D is not cholesterol itself, but a substance associated with cholesterol as obtained from all natural sources. We have since extended these observations to the phytosterols, and have found that when these are purified by way of the bromides they also yield no vitamin to irradiation; whereas all vegetable oils, and the sterols obtained therefrom and not so purified, readily acquire antirachitic properties under the action of ultra-violet rays.

These observations suggest that the provitamin (we propose to use this convenient term, suggested by Prof. Windaus, for the parent substance of vitamin D) is destroyed by bromine, and we have further found that it is equally destroyed by oxidation—e.g., by treating an acetone solution of cholesterol with potassium permanganate. Treatment with blood charcoal also frees ordinary cholesterol from the provitamin, but whether this is due to oxidation or adsorption has not yet been established.

Whilst these results afforded no means for the isolation or even concentration of the provitamin,

more direct evidence as to its nature was furnished by the observation that, unlike the vitamin obtained from it, the provitamin forms an addition compound with digitonin. Although the product recovered from the digitonide of ordinary cholesterol, by fractional extraction with xylol, contains the provitamin in increased amount, the complete separation of the latter from cholesterol or other sterols by this method does not appear to be practicable.

Heilbron, Kamm, and Morton[9] have recently shown that by fractional recrystallisation cholesterol can be separated into fractions of varying provitamin content, as judged by the intensity of the ultra-violet absorption spectra. We were able to test biologically, at Prof. Heilbron's wish, two fractions, one of which had been found by the optical test to be four times more absorptive than ordinary cholesterol, and our biological test confirmed the spectroscopic one. We are further informed by Prof. Windaus that he has found it possible, by fractional distillation of cholesterol in a high vacuum, to produce a 9 to 10-fold increase in provitamin content as measured by the optical test.

These observations afford significant information with regard to the nature of the provitamin. We may conclude that it is destroyed by bromine and by oxidation, but that it possesses the properties of a sterol, in so far as it forms an addition product with digitonin, and can be distilled in a high vacuum.

Previous work of Windaus (unpublished) had shown that the highly unsaturated sterol, ergosterol, could not be recovered unchanged from its bromide. It had already been observed by its discoverer, Tanret, that this sterol is extremely sensitive to light and air (oxidation), and this fact, together with its property of forming an insoluble digitonide, suggested a resemblance to the provitamin. The admixture in cholesterol from all animal sources (brain, eggs, gall-stones, &c.) of a sterol with more than one double bond seemed likely, in view of the well-known occurrence in phytosterols from vegetable oils, seeds, &c., of other representatives of this class, containing several double bonds. Further, from the fact that ergosterol possesses three unsaturated linkages, one would expect it to show a greater absorption in the ultra-violet region than cholesterol, which has only one double bond.

We therefore took up again, at Prof. Windaus's suggestion, the study of ergosterol, which we had previously found, after irradiation, "to be highly protective even in doses of one milligram," when comparing it under identical conditions with 5 mg. doses of irradiated cholesterol on the same batch of rats.[5]

In view of the more recent work on the absorption spectrum of cholesterol by Heilbron, Kamm, and Morton,[9] and by Pohl,[10] we compared the absorption spectrum of ergosterol with that of a specimen of ordinary cholesterol, and found that ergosterol exhibited a very pronounced absorption in the ultra-violet region, the characteristic band of absorption being like that of the cholesterol at 280 $\mu\mu$, but of enormously greater intensity. The intensity of the absorption was estimated to be 1500–2000 times as strong as that of brain-cholesterol. As the result of the irradiation this absorption band disappears just as in the case of cholesterol; at the same time the product loses its property of being precipitated by digitonin. If the provitamin were ergosterol, or an unsaturated sterol of similar constitution, the amount present in ordinary cholesterol would be of the order of 0·05 per cent., or 1 part in 2000, and irradiated ergosterol should in this case possess antirachitic activity in correspondingly small doses.

These assumptions have been fully confirmed by biological tests on rats. A daily dose of 4/1000 mg. of irradiated ergosterol cured and prevented rickets in rats kept on a rachitic diet. Tests with still smaller quantities, not yet completed, indicate that the limit of activity will prove to be less than 1/1000 mg.

### *Conclusion.*

These results seem to justify the conclusion that the naturally occurring parent substance of vitamin D if not ergosterol itself, is a highly unsaturated sterol of similar constitution.

It should be added that although ergosterol was originally isolated by Tanret from ergot, and named accordingly, similar or identical sterols have been obtained from a wide range of the lower plants, occurring, for example, abundantly in the fat extracted from certain yeasts. The ergosterol used in our own experiments above quoted was actually prepared from ergot, whilst that used by Prof. Windaus was obtained from yeast.

This work, which will be published in detail elsewhere, is the outcome of mutual suggestions made in the course of written and verbal communications between Prof. Windaus and ourselves, and Prof. Windaus will publish shortly the same results in Germany.

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## SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

### *Influenza.*

THE Board of Health has issued a memorandum to medical officers of health asking for information about the prevalence of influenza. The League of Nations' Health Section has asked for all available returns, but as the disease is not notifiable in Scotland no statistics can be furnished without a special inquiry. The medical officers of the principal towns are therefore asked to supply information at weekly intervals, this information being collected at schools, hospitals, clinics, and factories, and from health visitors and medical practitioners.

From current medical talk, I gather that in most areas in Scotland, some form of influenza is, at present, pretty common. In the first and second quarter of last year there was a considerable Scottish epidemic of influenza, mainly in the west, and the number of deaths in the 16 principal towns rose as high as 330 in April, after being 100 in March, 35 in February and 40 in January. It fell again to 7 in August, and even as recently as the third week of last December the deaths numbered only 9. In the four weeks ending Jan. 22nd, however, there have been 56 deaths and there is thus definite indication of a recurrence. Whether the disease is genuine influenza or not, the rising mortality shows its seriousness. The respiratory diseases in general also show an increase, and for the four weeks ending Jan. 22nd, the number of deaths corresponded to an annual death-rate of 3.8, 4.2, 3.3, and 3.2 per 1000. The average figure for the corresponding four weeks last year was 2.9. During the same period 96 cases of acute influenzal pneumonia have been notified, compared with 71 last year, and 1105 cases of acute primary pneumonia, compared with 784 last year. There seems, therefore, to be a perceptible increase of prevalence, but there is no very clear indication of the widespread infection which usually marks the arrival of specific influenza. If the current diseases are truly influenzal, it is obvious that the germ varies considerably in virulence. From the wind and rain storms of November and December and the exceptional gales of January, it may perhaps be inferred that there is, at least in Scotland, little probability of a wide spread serious epidemic this year. But the relation of the weather to influenza is too uncertain perhaps, to justify even this mild prophecy.

*Blood Pressure from the Clinical Standpoint.*

At the last meeting of the Edinburgh Medico-Chirurgical Society there was a good discussion on blood-pressure, principally from the standpoint of the general practitioner. Dr. Porter gave a careful description of cases and the results of treatment, but on almost every essential question of theory and practice opinion was very much divided. The points on which it turned were (*a*) the value of the diastolic pressure as an index and (*b*) whether in certain cases of high pressure any treatment was of any value. The discussion, indeed, showed clearly Dr. Maitland Ramsay's wisdom in having arranged a course on the subject at St. Andrews, in which Prof. MacWilliam gave an admirable statement of the physiological position. For the peace of mind both of patients and doctors, it is time to have the status of our present knowledge set out plainly, and it is to be hoped that the St. Andrews course will be made available in a convenient form. The subject is growing in importance, and methods of estimating blood pressure are now so simple and reliable that they can be used in general practice almost as a routine.

*New Children's Hospital at Leith.*

On Jan. 29th Sir John Gilmour, Bt., Secretary of State for Scotland, opened the new Children's Hospital at Leith which has been erected as a memorial to the dead of the Leith Territorial Regiment, the 7th Royal Scots. The earlier part of the present building was built over 60 years ago by the late Mr. Simpson, architect to the former Leith Corporation. The later section was built by his son, George Simpson, who succeeded his father as corporation architect and built the fine hospital at East Pilton for infectious diseases, probably the best of its size at the date. Mr. Simpson has now added to his reputation by this third hospital. He has made a fine use of the site, and the area round the hospital is unrecognisable by those who knew this part of Leith when it was covered by disgraceful slums. The hospital itself is only large enough for some 50 beds, but it has also a first class out-patient department. The two operating theatres would be hard to surpass for lighting and convenience; the fittings and furnishings are in the latest style, and the wards are commodious and luxuriously fitted. This is a War memorial of the best type.

## VIENNA.

(FROM OUR OWN CORRESPONDENT.)

*Temporary Sterilisation by Means of Hormones.*

UNUSUAL interest has been aroused by the announcement of Prof. Ludwig Haberlandt, of the University of Innsbruck, that he has succeeded in rendering white mice and rats temporarily sterile by the injection of extracts prepared from the placenta and ovaries of pregnant mice. He claims that later he was able to secure sterility in these animals for a period of six or seven weeks by feeding them on such extracts. Prof. Haberlandt based his experiments on the fact that the formation and expulsion of ova ceases during pregnancy. He explained this by saying that the endocrine secretion of an ovary changed by pregnancy produces the symptoms of pregnancy, notably stopping the formation of ova. He proved that hormones are the responsible agent by transplanting the ovary of a pregnant animal into a non-pregnant animal, when it was found that the pregnant foreign ovary suppressed ovulation in the host. In further experiments within the last three years he has injected extracts of pregnant ovary and of placenta (which also has an internal secretion) with the same result, and quite recently he has found that the effect is produced if such extracts are added to normal food. Sterility lasts for eight weeks after a full dose by the mouth, but the results were not satisfactory in all cases and the efficacy of oral administration is not entirely proved. Prof. Haberlandt points out that it is not yet possible to employ this method for the production of sterility in human beings. Use of the extracts is not without danger and there is a risk that permanent sterility may result instead of the temporary immunity to pregnancy desired. It will be remembered that Prof. Haberlandt recently described experiments demonstrating the existence of a cardiac hormone.[1]

*The Health of Vienna.*

The pandemic of influenza now raging in Western and Northern Europe seems to have so far kept away from Austria. There has been a slight increase in febrile bronchitis and gastro-intestinal troubles, and colds with aural and nasal complications have been very common, especially in children. But the well-known "flu" of 1918–19, with its severe course and high mortality, is luckily absent as yet. This is emphasised in the report of the Vienna "Health Bureau," presented a few days ago to the Municipal Senate, which gives some interesting figures for 1926. During that year the population of Vienna stood at 1,800,670, as against 2,020,090 in 1913. The number of live births was 23,485 last year, and 26,216 persons died. The birth-rate is steadily falling and its decline is only partly counter-balanced by a decrease in infant mortality. In 1910 no less than 17·5 per cent. of all new-born children died in their first year; in 1914 the figure stood at 14·8 per cent.; but last year, as in 1925, a mortality of only 8 per cent. was recorded. The number of persons certified as insane was 2356, and 40 per cent. of the cases were described as due to alcohol, whereas in the previous year less than 35 per cent. of insanity was attributed to this cause. The campaign against tuberculosis has been actively carried on by the municipal board of health at its tuberculosis centres. In 1924 25,113 persons applied to these institutions for examination and advice, but in 1925 the number went up to 43,720, and last year 65,217 were examined. As every case found affected remains on record and all members of the family are looked after and cared for from the point of view of prophylaxis, this means a thorough examination of at least 20,000 families yearly. Great care is taken of the health of children, and in the age-period of 3–6 years (pre-school age) all poor children may be sent to one of the public kindergartens, of which there are now 250. Here they are under constant supervision by trained nurses. Great attention is also paid to the dental health of school-children. School dental clinics were started in Vienna six years ago, and in 120 public elementary schools all the children between the ages of 6 and 14 now have their teeth looked after. The poor ones are also treated free of charge, some 40,000 being thus under constant observation. One remarkable feature of the returns is the comparatively large number of octogenarians. In 1910 only 4 per cent. of all deaths occurred in persons over 79 years, but last year the figure was 7·8 per cent. In 1926, moreover, the general death-rate was only 14 per 1000, as against 19 per 1000 in 1910, and it is evident that more people live to a great age than formerly.

*Removal of the Entire Colon.*

A unique case was demonstrated recently at a meeting of the Vienna Society of Practitioners by Dr. Eichenwald. The patient was a man 26 years old, who had been under treatment for ulcerative colitis since 1914. In that year an artificial anus had been made in the cæcal region, and gradually the ulceration had healed with lavage of the colon. But the lumen of the colon became progressively narrower until complete occlusion occurred, and rectal examination showed that beyond a point a few centimetres above the sphincter the walls of the canal had completely grown together. In the spring of last year Dr. Eichenwald resolved to perform an ileo-anastomosis so as to enable the patient, who had wonderfully regained his strength, to pass his motions per vias

[1] THE LANCET, 1926, ii., 973, and Jan. 1st, 1927, p.37.

naturales. The lowest part of the ileum was severed transversely, the rectum was thoroughly mobilised and cut transversely some 5 cm. above the anus, and the proximal end of the ileum was pulled through the rectum and fixed outside on the anus. At a second operation five months later the entire colon—ascending, transverse, and descending—was extirpated, together with the peripheral part of the ileum, and at the same time the artificial anus was closed by a plastic operation. The patient made an excellent recovery after both operations. The lowest part of the ileum, which had been pulled through the rectum, sloughed away, so that the patient now possessed a few centimetres of his former colonic intestinal canal—viz., the lowest part of the rectum. His motions were at first very frequent, watery, and copious. Now they have regained the normal consistency; they are passed 6–8 times in 24 hours, and the sphincter is completely continent and acting normally. The extirpated colon was demonstrated. It is completely obliterated and very much shrunken, its walls are stiffened, and the lumen is filled with scar tissue. Up till now no case has been recorded in which such an extensive removal has been successful.

*Another Method of Rejuvenation.*

For the last 18 months Dr. Doppler has been experimenting on suitable cases with the effects of painting the spermatic (or ovarian) artery with a 7 per cent. aqueous solution of carbolic acid. He has found that this produces marked hyperæmia of the testicle (or ovary), with enlargement of the gland. In cases in which there has been hypofunction the secretion of the hormones is decidedly increased, and Dr. Doppler notes a remarkable improvement of appetite some 10 to 14 days after the painting. The nervous symptoms, he says, soon improve; the appearance of the individual becomes better, and the basal metabolic rate, which is generally lowered in hypofunction of the sexual glands, returns to normal. The physical and psychic activity of the patient is markedly increased. Dr. Doppler recently showed a series of patients (he has so far operated on 160) in whom the changes thus produced are very obvious. He explained that his method is much simpler than vasectomy or vasoligature, and though it is useless in cases of psychic impotence it should be tried for organic impotence before other and more drastic measures.

## MEDICINE AND THE LAW.

*Operation without Patient's Consent.*

To what extent is a surgeon justified in performing an operation to which the patient has not consented? This was the issue in a recent action at the Liverpool Assizes, a case reported in some detail in our news columns. The verdict went in favour of the defendant surgeon, who maintained that he had operated to save life. The jury added a rider to the effect that operations should not be performed without the patient's consent—a general proposition to which all will assent. The legal position has two aspects, the civil and the criminal. Prima facie the performance of a serious surgical operation means the infliction of bodily harm, but it is saved from being a crime because of the patient's actual or tacit consent. Stephen's "Digest of the Criminal Law" has stated in the past, very sensibly, that any person may, for surgical purposes connected with the preservation of life or health, consent to the infliction of any bodily injury upon himself or on any child to whom he stands *in loco parentis*, and who is too young to exercise reasonable discretion. The injury inflicted must be reasonably within the limits of the consent given; its risks must be explained or understood; and the operation must be performed with proper care or skill; otherwise the surgeon will be civilly or criminally liable. In the recent edition of 1926 the Digest states that if a person is incapable of giving consent it is not a crime to operate and inflict bodily harm without his consent, and in spite of his resistance. Three illustrations of this proposition are given. In the first, if A is rendered insensible by an accident which makes it necessary to amputate one of his limbs before he recovers his senses, the amputation without his consent is not an offence. Secondly, if the accident makes him mad, the amputation, in spite of his resistance, is no offence. Thirdly, if B is drowning and insensible, and A, to save his life, pulls B out of the water with a hook which injures him, this again is no offence. Against this passage the learned editors of the Digest retain the following footnote: "I know of no authority for these propositions but I apprehend they require none: the existence of surgery as a profession assumes their truth."

The Digest was primarily concerned with the criminal aspect; Stephen was explaining how far consent could be a defence to a prosecution for inflicting grievous bodily harm. The civil aspect of the matter—namely, the possible remedy of the patient in the form of obtaining damages where an operation has been performed without his or her consent—was dealt with in the case of Beatty *v.* Cullingworth, tried by Mr. Justice Hawkins in 1896, not mentioned in the law reports, but noted in the Medico-Legal Society's *Transactions* in 1909, and cited in Halsbury's "Laws of England." It was the case of an operation for ovarian cyst. The patient told the surgeon beforehand that she would not consent to the removal of both ovaries as she was going to be married. "If you find both ovaries diseased," she said, "you must remove neither." The surgeon replied, "You may be sure I shall not remove anything I can help." When operating, the surgeon found the right ovary cystic and removed it. He also found the left ovary to be in an early stage of the same process, and he formed the opinion that it was necessary to remove it in order to save the patient's life. He did remove it, and the patient afterwards brought an action for negligence. Hawkins addressed the jury as follows: "If a medical man, with a desire to do his best for the patient, undertakes an operation, I should think it is a humane thing for him to do everything in his power to remove the mischief, provided that he has no definite instruction not to operate. There was here no question as to the propriety of the operation, and the defendant always told the plaintiff she must give him a free hand. If you think tacit consent was given, you must find for the defendant." The jury did so. It was, of course, a question of fact for the jury whether there was an express or tacit consent. The patient's previous stipulation, quoted above, is not quite consonant with the judge's statement that she had given the surgeon a free hand. Sir Frederick Pollock, in a well-known text-book, remarks guardedly that, "in cases of necessity when an operation is necessary and the patient is unconscious, and unable to consent, and no person entitled to consent on his behalf is available, the operation is probably justified."

*Accident with a Junker Inhaler.*

An apprentice artificer, aged 16, died 20 hours after undergoing a minor operation for the removal of tonsils at the Royal Herbert Hospital at Woolwich. The evidence at the inquest at Lewisham showed that chloroform and ether had been administered by the open method. When one tonsil had been removed, it was necessary to use the Junker apparatus, applying the anæsthetic through a nostril. In the assembling of the apparatus an error was made, and the patient actually received liquid chloroform in the nostril instead of chloroform vapour. The mistake was at once discovered, and all possible remediary measures were taken. The patient revived but subsequently died as stated. Witnesses gave evidence that the apparatus was assembled by a corporal in the laboratory. The corporal was not called at the inquest, and the two officers of the R.A.M.C., who had acted as anæsthetist and surgeon respectively, stated that they did not desire to shift their responsibility. The coroner returned a verdict of "Accidental Death," expressing the hope that extreme care would

be exercised in future in the assembling of the apparatus, and that no further accident of the kind would be allowed to occur.

We have had occasion before to comment on such a catastrophe, and to inquire what would be a safeguard against its occurrence? The first and best is to test the apparatus each time before use. But since it may be impossible to eliminate completely the human element of risk, a final safeguard is to employ fool-proof forms of inhaler, such as those associated with the names of Hewitt, Buxton, and Shipway.

## THE REGISTRATION OF DEATHS.

A REGULATION, dated Dec. 31st, 1926, has been made by the Registrar-General, imposing the following requirements upon registrars of births and deaths:—

Where the contents of the medical certificate show that the deceased was not seen after death by the certifying practitioner, and was not seen alive by him within 14 days of the date of death, the death should be reported to the coroner by the registrar.

To this new regulation the following instruction is appended:—

In the case of all medical certificates given on the new official form bearing serial numbers with the prefix "Y," the certificate will clearly show whether the deceased was seen after death or not. In the case of a certificate given on the forms previously issued with the prefix "X," or any older form, the omission of the words "as I am informed" from the blank in the relevant portion of the form is to be taken as meaning that the practitioner saw the deceased after death and is thus prepared to certify from his own knowledge that death took place. But if the registrar has any reason to suspect or believe that the omission was not deliberate, but was due to inadvertence, he should make inquiry of the practitioner in any case where the deceased was not seen alive within 14 days of death.

The Secretary of State has recently called the attention of coroners to this regulation in a circular letter which contains the following observations:—

The regulation is based upon the view that responsibility ought not to be accepted by the registrar for registering the fact and cause of a death on the evidence of a certificate given in the circumstances indicated in the regulations, unless he has previously given the coroner an opportunity, at any rate, of investigation or inquiry.

When a certificate of death is referred to the coroner under the new regulation, two points may arise: (*a*) what proof is there of the *fact* of death—i.e., what proof is there that a *body* is lying within the coroner's jurisdiction?; (*b*) is the *cause* of death sufficiently established, or is investigation by the coroner required?

The first point can be cleared up in various ways, according to circumstances. In some cases the coroner may consider it desirable or necessary to ask the doctor why he has not seen the body, and to request him to see it in order that the doctor may amend his certificate in that respect. If it is impracticable for the original certifier to see the body, the coroner, in parts of the country where the schedule made by the local authority enables payment for such a service, may upon sufficient occasion ask another practitioner to see the body and report to the coroner as to the fact of death, and, if necessary, also as to the cause of death. In many cases it may be found upon view by the coroner's officer, in the course of his inquiries, that the fact of death is painfully obvious.

As regards the second point, the necessity for investigation, it is for the coroner to decide whether the circumstances are such as to require investigation by him, having regard to the duties imposed upon him by law. The mere reference of a certificate to the coroner by the registrar does not of itself set up an obligation to investigate. Such reference is only one of many means by which a coroner may have his attention drawn to a death and to the possibility that action by him may be necessary. It is open to a coroner to decide at once to inform the registrar that in his opinion no inquest is necessary, or to institute such inquiries and obtain such information as he may think requisite before deciding whether to inform the registrar as above or whether to hold an inquest.

## LISTER CENTENARY.

A COMMITTEE consisting of representatives of the Royal Society, the Royal Colleges of Physicians and Surgeons, the Royal Society of Medicine, the British Medical Association, the universities and other institutions interested, has been formed to organise a celebration in London of the centenary of the birth of Lord Lister, which falls on April 5th next. Representatives of learned societies, universities, and medical bodies in Great Britain and delegates from the dominions and principal foreign countries will be present. The delegates will be received by H.M. the King at Buckingham Palace on April 4th. The programme, so far arranged, is as follows:—

April 5th: Reception and short addresses by some of the delegates in the large hall of the British Medical Association. Conversazione at the Royal College of Surgeons of England. Dinner given by the Merchant Taylors Company, of which Lord Lister was a member.

April 6th: Memorial service in Westminster Abbey; address by the Bishop of Birmingham. Discourses in the Robert Barnes Hall of the Royal Society of Medicine, on Lister as Physiologist, Pathologist, and Surgeon, by Sir Charles Sherrington, Prof. W. Bulloch, and Sir Berkeley Moynihan. Conversazione at the rooms of the Royal Society.

The Executive Committee consists of Sir James Berry, Sir John Rose Bradford (chairman), Sir John Bland-Sutton, Prof. William Bulloch, Sir Watson Cheyne, Dr. H. H. Dale, Mr. R. G. Hogarth, Sir Berkeley Moynihan, Sir Humphry Rolleston, Sir Ernest Rutherford, Sir Charles Sherrington, Sir Harold Stiles, Sir StClair Thomson, Mr. W. Trotter, Mr. Logan Turner, and Prof. A. Young.

A public meeting in further celebration of the centenary is to be held in the McEwan Hall, Edinburgh, at 8 P.M., on Wednesday, July 20th, coinciding with the British Medical Association's annual meeting. Earl Balfour will preside, and short addresses will be delivered by Sir William Watson Cheyne, Prof. Tuffier, Prof. Harvey Cushing, and Dr. James Stewart. A museum of Lister relics will be on view in the Upper Library of the Old University.

A Lister memorial volume has been prepared, edited by Dr. Logan Turner, which contains a variety of contributions, including a sketch of Lord Lister's life, given by his former house surgeon, Sir George Beatson, and a series of short personal reminiscences by many old friends from all parts of the world. Two of Lister's scientific addresses and a series of letters of general interest are to be incorporated in the book.

The sum of £25 and a gold medal will be awarded as a prize for the best essay submitted on the subject "The Influence of Lister on Surgery," by students and graduates of not more than one year's standing of any medical school in the British Empire.

NEW POOR-LAW HOSPITAL IN SHROPSHIRE.—Last week Lady Berwick opened at Berrington, near Shrewsbury, a hospital of 140 beds established by the Atcham Board of Guardians in a former workhouse. The buildings have been remodelled and equipped at a cost of about £15,000 and will be used for private paying patients as well as for Poor-law cases. The alterations provide for eventual extension to 300 beds.

ORTHOPÆDICS IN WARWICKSHIRE.—It is proposed to establish in Warwickshire a scheme for the treatment of crippled children. At present orthopædic treatment is provided by the Coventry and District Crippled Children's Guild and the Nuneaton clinic, but only about a quarter of the county is thus served, though much work of this kind is being carried out voluntarily at St. Cross Hospital, Rugby. It is proposed to establish clinics at Rugby, Warwick, Stratford-on-Avon, Kineton, and perhaps elsewhere. There are 350 crippled children of school age in the county area.

# Correspondence.

"Audi alteram partem."

## THE PAPWORTH COLONY AND SIR CLIFFORD ALLBUTT.

*To the Editor of* THE LANCET.

SIR,—A small committee of the friends and admirers of the late Prof. Sir Clifford Allbutt has decided to erect to his memory at Papworth two cottages, with which his name will be permanently associated, for men disabled by tuberculosis. The men will be chosen from among those who could not under ordinary conditions support themselves and their families. Sir Clifford Allbutt, as President of Papworth Colony, from the beginning was always deeply interested in the work there, and it is felt that there could be for him no more fitting memorial.

A certain amount of money has already been promised, and we shall be very grateful if those who would like their names added to this memorial to a great man will kindly send donations, however small, to Mrs. Marcus Dimsdale, Papworth Hall, Cambridge. It is hoped that the cottages will be opened some time during the summer by H.R.H. the Prince of Wales, and that as many subscribers as possible will endeavour to be present.

We are, Sir, yours faithfully,

FREDERICK MILNER.
HUMPHRY ROLLESTON.
ARCHIBALD E. GARROD.
J. K. FOWLER.
ROBERT JONES.
P. HORTON-SMITH HARTLEY.
HUGH K. ANDERSON.
H. J. GAUVAIN.

Papworth Hall, Cambridge, Jan. 30th, 1927.

## ASYMMETRY OF THE JAWS.

*To the Editor of* THE LANCET.

SIR,—Hitherto I have been unable to find in any of the ordinary text-books of medicine or surgery reference to simple arthritic or synovitic conditions affecting the temporomandibular joint. It does not appear to be commonly affected by the diseases which cause so much trouble in other joints of the body—perhaps fortunately so, since it is constantly and necessarily used in biting, mastication, and articulation. My attention has been drawn to this subject by virtue of a recent personal attack of acute inflammation of the temporomandibular joint of the right side. The attack was unlike anything previously experienced, and though acutely painful for a time, seemed not to be serious, for it cleared up entirely in three or four days with external application of ung. methyl salicyl. co. (B.P.C.). For reasons which follow, however, I have thought the condition would bear description.

In the first place, as with so many similar affections, no likely causal factor was apparent. The attack commenced with an initial grating sensation experienced only on opening the mouth very widely, more particularly when lowering the jaw was combined with protraction. The affection remained in this simple state for about a fortnight without appearing to get either worse or better. At the end of this time the condition suddenly became more acute and the inflammation more extensive. The grating sensation was now felt during the ordinary movements of the joint, being, of course, much more marked during the movements already alluded to. In addition to the grating there was now a fair degree of pain, such that the mouth was unable to be fully opened without a sense of impending dislocation accompanied by considerable pain. The grating, too, was of a peculiar type, being *heard* rather than felt. It seemed as if the mandibular condyle were endeavouring to slip over a roughened eminentia articularis. This was especially so during attempts at protraction of the jaw. After a few days of treatment, the inflammation subsided and has left no damage as far as sensations enable one to judge.

To me the condition has been most interesting on account of its unilateral position. The question naturally arises as to why the process should affect the joint of one side only. Probably the simplest cause would be a draught or some similar influence playing on the affected side. This explanation seems feeble and insufficient to account for all the facts, especially considering the rather subacute commencement of the process, which is certainly not suggestive of cold or exposure such as is productive of one form of facial nerve paralysis. It rather seems to me that the explanation is to be sought for in the anatomical asymmetry of the temporomandibular joint. Most likely the side affected is the joint used more than its fellow, and hence open to more damage. In support of this is the fact that during the attack the mandibular condyle could be felt to make a greater excursion on the affected than on the normal side. When both joints are normal the excursion of the condyles is not appreciated, the movement of joint surfaces being an action that is not brought into consciousness except in a vague or general way. In the inflamed state the movement is only too well appreciated.

My inference is that probably the articular surfaces of the right temporomandibular joint are more extensive than the left, possibly from greater usage in mastication or as a heritable quality. In brief, is it not possible that man is right-jawed as well as right-handed?

The anthropologists do not seem to have paid much attention to measurements of the condyles of the jaw. Asymmetry is a well-recognised phenomenon in many head structures, especially the parts of the face, the nasal septum, and the bones of the skull. A good account of these is given by R. Martin (Lehrbuch der Anthropologie, pp. 341, 638), but he does not mention the condyle of the mandible in his catalogue. I have taken the opportunity of measuring the width and anteroposterior diameter of the condyles of several mandibles of both sexes, and find that on one side, usually the right, the condyle is both wider from side to side and broader from before backwards by a measurement of the order of 1 mm. in the former case and slightly less in the latter. The condyles also show differences in shape and outline on the two sides.

The general head asymmetry is therefore also applicable to the temporomandibular joint, and hence probably also to the soft parts in relation thereto. This asymmetry may be hereditary or acquired. If acquired it is probably due in part to the effects of masticating more on one side than the other, a feature common enough when carious teeth are present on the opposite side of the jaws. This factor alone, however, will not account for condylar asymmetry, because alternations are bound to occur in respect to the side used chiefly in mastication in the same individual from time to time. Heredity is probably the main factor as in the asymmetries of other parts.

I am, Sir, yours faithfully,

W. C. OSMAN HILL, M.D.

Anatomy Department, University of Birmingham, Jan. 19th, 1927.

## FAT AND TUBERCLE.

*To the Editor of* THE LANCET.

SIR,—I read with great interest Dr. W. B. Vaile's article on Pulmonary Tuberculosis in your issue of Jan. 8th. I have myself never come across a case of consumption, whether in the early or late stages, in which the patient did not say "Oh! I can't eat fats," or the parents (guardians) did not inform the doctor emphatically, "We could'nt get the patient to take fats."

I am, Sir, yours faithfully,

R. MARTIN, L.R.C.P. & S. Edin.

Banbridge, Co. Down, Jan. 28th, 1927.

## BLOOD PRESSURE IN INFLUENZA.

*To the Editor of* THE LANCET.

SIR,—Referring to Dr. Shore's letter on the need for keeping convalescents from influenza in bed, and for the administration of tonics until the low systolic blood pressure has risen, I should like to point out that a condition of chronic low blood pressure is far from uncommon, and occurs in people in whom it would not be expected. I have a dozen patients in my practice whose systolic blood pressure has to my knowledge never risen above 105 mm. Hg for two years. If such a patient were to contract influenza he might be condemned to a decidedly long convalescence. Very little seems to be known about this condition of chronic hypopiesis. It seems to be more common in males than females, 10 males and 2 females in my cases, and their aged range from 30 years to 80 years. All of them are active and earn their own livings, including the man of 80, who is in full work as a surveyor. Four of them are farmers and walk many miles a day. They all live hygienic lives and six of them have always been non-smokers.

The symptoms most commonly complained of are (1) giddiness when assuming the erect posture; (2) lassitude and a vague feeling of being out of sorts. They sweat a good deal during physical exertion. These cases are often slightly hypochondriacal, they are quiet and reserved in temperament and not given to enthusiasm. They exhibit an astonishing tolerance of belladonna, including the patient of 80 years. I have not found any decided benefit with the usual tonic-treatment and hygienic measures, such as cold or tepid baths and liberal diet. Daily injections of pituitrin and adrenal extract were tried, but apart from the immediate rise of blood pressure for an hour or so no benefit resulted.

I have recently treated eight of these cases with "coramine" (a 25 per cent. solution of pyridine-β-carbonic acid diethylamide). A dose of 25 minims was given twice a day by the mouth and continued for 14 days. In every case there was a great improvement in the patients' sense of well-being and energy. The giddiness disappeared. In all cases but one the systolic blood pressure rose and was never less than 120 mm. Hg, and in some cases the blood pressure rose to 130 and 140 mm. Hg. It was noted that very little or no improvement took place during the first week of administration in most of the cases. In regard to the permanence of the raised blood pressure after the "coramine" has been discontinued these chronic cases of long standing appear gradually to revert to their previous state in the course of four or five weeks.

I have not yet used "coramine" for the hypopiesis resulting from influenza.

I am, Sir, yours faithfully,

P. D. H. CHAPMAN, M.B., B.Ch. Camb.

Bridlington, Jan. 31st, 1927.

## NEW NAMES FOR OLD DISEASES.

*To the Editor of* THE LANCET.

SIR,—In the discussion following Sir Humphry Rolleston's address on Changes in the Clinical Aspects of Diseases (THE LANCET, Jan. 15th) I alluded to a possible source of confusion arising from occasional change in name of diseases, and I hope you will allow me to mention here one or two other examples of such a change in names. The rare disease in children to which I alluded was named "erythrœdema" in 1914 by Dr. H. Swift, of Adelaide, Australia. An objection to the name was that there was no obvious œdema, though the extremities might appear turgid. Recently, however, the disease has been called by a still more unsuitable name, "acrodynia."[1] The latter name had been previously bestowed on the great epidemic disease (hardly likely to be identical) which attacked about 40,000 persons in Paris during less than a single year (1827-28). The names of well-known diseases such as measles and scarlet fever can hardly be altered, but uncommon and relatively little-known diseases can be altered by any author who writes on them. A recent example is that of tuberous sclerosis of the brain, often associated with Pringle's multiple telangiectatic type of adenoma sebaceum of the face. Whenever the latter was present in the subjects of epilepsy or mental deficiency the presence of tuberous sclerosis of the brain was suspected, but could hardly be proved without a post-mortem examination. Dr. E. B. Sherlock,[2] not contented with these names, coined a new one, "epiloia," which he regarded as suitable, being "short, unmeaning, distinctive, and capable of forming an adjective." Thus, at recent meetings of the Royal Society of Medicine [3] cases have been shown under the heading, "epiloia." It seems inconvenient, to say the least, that, when careful studies of the subject have been published in various countries under the heading, Tuberous (or Tuberose) Sclerosis, the latter name should be arbitrarily displaced in favour of "epiloia," recommended by its introducer as being "meaningless." In 1920, when Sir Arthur Keith proposed the name "diaphysial aclasis" for the disorder of growth generally known as "multiple exostoses," there was at the back of his suggestion at least an interesting scientific theory of causation. Moreover, it is possible that the developmental disorder in question may occasionaly occur without the formation of actual exostoses [4] But there is no excuse of the kind for "epiloia."

I am, Sir, yours faithfully,

London, W., Jan. 18th, 1927. F. PARKES WEBER.

[1] The heading of W. Weston's article on the subject in Abt's Pediatrics, ii., 986.

## PELLAGRA IN NYASALAND.

*To the Editor of* THE LANCET.

SIR,—I beg your permission to reply to criticisms made by Dr. Hugh S. Stannus in reference to my article on Pellagra in Nyasaland which appeared in your issue of Jan. 8th. I read the first communication Dr. Stannus made to the Royal Society of Tropical Medicine and Hygiene on Pellagra in Nyasaland with very great pleasure, and I have the fullest admiration for the accurate description of the disease that he gave on that occasion. I did not read his second communication on the same subject until quite recently, and I was unaware that cases of the disease had been discovered in members of the general population previous to my own observations. However, my work confirms his original obervations on that point.

Dr. Stannus seems to imply in his letter that I claim to be the first observer to formulate the theory that the pathological lesions in pellagra are due to a toxin, whereas I merely try to prove by my observations that the toxin acts upon various systems in the body and so produces the characteristic features of the condition. I am convinced that one of the chief actions of the toxin is to interfere with the correct functioning of the thyroid gland, hence my comparison between certain signs in pellagra and other signs in myxœdema. Further, the above theory has received substantial support from post-mortem evidence, the source of which I stated in my article. My observations are the result of clinical investigation, and whatever the pathological changes in the nervous system may be, there are signs of a peripheral neuritis in the early stages of the condition, to quote Dr. Stannus, "pins and needles, and burning pains in the soles of the feet, especially along the outer margin and in the pulps of the toes, pains

[2] The Feeble-Minded, London, 1911, p. 242.

[3] Section for the Study of Disease in Children, Oct. 22nd, 1926, and Section of Psychiatry, Jan. 11th, 1927.

[4] F. P. Weber: A Developmental Deformity of the Right Forearm, similar to that sometimes met with in cases of Multiple Exostoses (Diaphysial Aclasis, of Keith), Proc. Roy. Soc. Med., Clinical Section, 1925, xviii., 25.

in the legs, especially the calves, were an almost constant symptom, and associated with considerable tenderness on pressure of the calf muscles. The knee-jerks were diminished in some cases and increased in others."

Dr. Stannus further states in his letter, "observations on a large number of cases have, however, proved to me that the sun's radiations are the only factor in causing a typical distribution of the rash"; he then inadvertently disproves the above by stating in the same letter, "The affection of the scrotal skin, which was, I think, first pointed out by myself, may result from heat and moisture." I would inquire why, if the scrotal condition is the result of heat and moisture, are the axillæ, which are both moister and hotter, exempt from the eruption?

I have noticed that friction produced by the movement of a loin cloth over the great trochanters, and over the prominence of the buttocks, will sometimes cause the appearance in that area of the typical dermatitis in a pellagrous subject. Further, I have knowledge of at least one case, a patient who had been confined to bed in hospital for eight weeks and yet developed a very well-marked pellagrous dermatitis, although she had never come in contact with direct sunlight during that period. In my series of cases the skin was usually thickened, rough, coarse, and scaly, although each individual had a good wash at least once daily.

I mentioned "slight œdema" occurring in pellagra, it is not, however, a true œdema, for it does not pit on pressure. It is really more of a puffiness of a solid nature, and occurs in patients who have had several attacks of the disease.

The rhagades, like soreness at the angles of the mouth, mentioned by Dr. Stannus, was present in a considerable number of cases, but also occurred in other patients who had no signs of pellagra, and who never, to my knowledge, developed the disease.

May I repeat my observations suggested to me that "in pellagra there is a deficiency in thyroid secretion, a neuritis of certain nerves in preference to others and skin lesions corresponding to the distribution of those nerves."

In conclusion, I thank Dr. Stannus for his kindly criticism, and I trust my explanation will be acceptable to him.—I am, Sir, yours faithfully,

HORACE M. SHELLEY.

Addison Court-gardens, Kensington, W.,
Jan. 22nd, 1927.

## SICKNESS BENEFIT AND UNEMPLOYMENT.

*To the Editor of* THE LANCET.

SIR,—The leading article entitled Health Insurance Funds in your issue of Jan. 22nd comments on the large relative increase in sickness benefit coincident with industrial strife and unemployment. In this connexion the following case occurred at this institution this morning, and is illuminating. A factory worker applying for employment as a domestic was asked when she last saw her panel doctor. The following dialogue occurred:—

*Applicant.*—This week.

*M.O.*—What was the matter with you?

*Applicant.*—Nothing, but I was out of work.

*M.O.*—But why go to your doctor?

*Applicant.*—Because it was quicker to get sickness benefit than unemployment benefit, and not so much trouble.

*M.O.*—But did your doctor know that was your reason for going?

*Applicant.*—Oh, well, you see he always does that for me when I am out of work, and says I am anæmic.

I am, Sir, yours faithfully,

WILLIAM C. FOWLER, M.D.

Pinewood Sanatorium, Wokingham, Berks,
Jan. 26th, 1927.

*** If the applicant was telling the truth she was recording a situation which is almost the despair of the Ministry of Health.—ED. L.

## PULMONARY EMBOLISM FOLLOWING OPERATION.

*To the Editor of* THE LANCET.

SIR,—Dr. W. A. Lister's interesting statistical investigation into the causation of post-operative pulmonary embolism in your issue of Jan. 15th draws attention once more to a subject which has been freely discussed and written of during the last few years. So much indeed has post-operative pulmonary embolism been in the limelight, that there has been a tendency on the part of the profession to give but scant attention to the cases of pulmonary infarction and embolism which occur independently of operation. It has been my experience, ever since influenza "came back" in 1918, to meet with these cases in increasing numbers, so that pulmonary infarction is a common phenomenon in my practice. The infarctions take place in healthy people following attacks of influenza generally during convalescence from an influenzal tonsillitis. Other varieties of embolism are also commonly observed, but I am concerned at present with the pulmonary. It is my belief that the great majority of cases of influenzal pleurisy and pneumonia, so called, are really examples of pulmonary infarction. Often the cases are not diagnosed, but in many of the cases one observes the characteristic sticky plum-coloured sputum; it is interesting to note that a good number of these cases are mistaken for phthisis. Further, it is probable that many of the mysterious sudden deaths after influenza, usually ascribed to heart failure, are really due to massive pulmonary embolism. The influenzal origin of the cases is proved by the fact that one sees the cases in rushes during the influenza epidemics and waves, after having gone for months without seeing anything suggestive of a case of embolism. Moreover, at the same time as one is seeing these cases of pulmonary infarction one is seeing cases of embolism in other organs. In other words, at certain seasons embolism becomes very prevalent. The natural conclusion can only be that influenza is an important factor in the causation of embolism. In what way is this brought about? Surely by an increased coagulability of the blood. That the blood is profoundly affected is shown by the fact that several of my cases of pulmonary infarction have shown well-marked jaundice, most probably due to a hæmolytic streptococcus associated with the influenzal attack.

In what way do the above facts throw light on the cases of pulmonary infarction that occur after operation? Personally, I can count the number of post-operative cases on my fingers, but I *can* say that whenever I see a case of post-operative pulmonary infarction at the hospital to which I am attached, I see outside the hospital at the same time similar cases of infarction in patients on whom no operation has been performed; these patients are suffering from influenza.

To give an example of what I mean. In the 19 days from August 30th to Sept. 17th, 1925, when influenza was very prevalent in my practice, I saw (1) a fatal case of pulmonary embolism after childbirth; (2) a case of pulmonary infarction with blood sputa after an operation for hernia; (3) a cerebral embolism with ensuing cortical hemiplegia; and (4) a cerebral embolism fatal in 12 hours. I had seen nothing like a case of embolism since the preceding May. In this month influenza was epidemic, and I saw three cases of embolism. I have noted the same thing many times. Again, I remember well a fatal case of pulmonary embolism (verified by autopsy) in a patient the day before he was to have been operated on for chronic appendicitis. If the fatal event had been delayed another day the operation would have been held accountable. Do not the above facts suggest that the operative cases are in some way related to the non-operative cases? I am certain that the importance of influenza in this respect has been overlooked. At a recent discussion at the

Royal Society of Medicine, very little attention seemed to be paid to Featherstone's [1] suggestion that colds and influenza played a great part in the production of post-operative pulmonary complications, though I am convinced he was nearer the mark than many of the other speakers.

There is no doubt that there has been a great increase in the number of cases of *medical* pulmonary infarctions seen in practice, and Sir C. Gordon-Watson has shown that at St. Bart.'s Hospital, at least, there has been a relative increase in the *surgical* embolisms. This is surely to be expected when influenza is so constantly with us. It would certainly be rather wonderful if out of the thousands of patients undergoing operations daily none were suffering from the blood changes that must be present in a large proportion of the population at certain (influenzal) seasons. To sum up post-operative embolism must be, in certain cases at least, a coincidence which has nothing really to do with the operation. It would have been extremely interesting if Dr. Lister's investigation had shown whether the cases he analysed occurred most frequently at the dates of the well-marked influenza epidemics.

What of the prevention of these cases? I now give potassium citrate as a routine to all my influenza cases. With regard to the exercises that are advocated after operation, I would only state that my experience shows that it is the restless, excitable patient, rather than the placid contented individual, who is liable to embolism.

One moral can be drawn—no operations but the most urgent should be performed during the influenza seasons.—I am, Sir, yours faithfully,

Aberdare, Glam., Feb. 1st, 1927. AMBROSE W. OWEN.

## IMMUNITY TO IMPLANTED TUMOURS.

*To the Editor of* THE LANCET.

SIR,—I should like to endorse Dr. Mottram's remarks in his letter in your last issue. It has, of course, been known for many years that a limited amount of growth will take place in serum, but the majority of tissue culture workers have discarded this medium as the growths obtained by its employment are more of the nature of what Fischer has termed outwandering of cells rather than real growth. In our experience, all strains of carcinoma and other epithelial tissues, whether grown in liquid or solid media, grow either as continuous sheets or in the form of long finger-shaped processes. The cells described and figured by Dr. T. Lumsden we regard in our cultures as fibroblasts and cells derived from the stroma: these are frequently seen in cultures in which the true cancer cells are growing badly. So far as I am aware there is no evidence that inoculation of such outwandering cells *only*, free from the original fragment into mice, ever gives rise to tumour formation.

Inoculation of the sheet type growth from, say, carcinoma 63 into mice produces typical tumours in the usual way. I think Dr. Lumsden's figures emphasise the necessity of working with pure cultures in this type of experiment.

I am, Sir, yours faithfully,

A. H. DREW.

Stroud Laboratories, Mill Hill, N.W., Feb. 1st, 1927.

## BAY MOUNT, PAIGNTON.

*To the Editor of* THE LANCET.

SIR,—Thank you for the kind reference to the Bay Mount Annual report, which you make in THE LANCET this week. I appreciate the encouragement greatly. May I, however, point out that the reference to injections and tonics might be read by a nervous patient as meaning that the injections were also given two hourly, whereas the injections are only given twice or thrice daily according to circumstances. Critical readers might consider that to fail to cure two out of seven cases was not a good record. Again, in the reference to five cured cases out of seven, it is not quite clear that one case was not treated at all because he was too ill, and that another did not present himself for treatment, but for a change only. He had a special permit to obtain morphine, for reasons of health, and it was not considered advisable to withdraw his drug. He came to Bay Mount for a few weeks change while his wife was changing houses and preparing a new home for him. This patient has since died.

The five treated cases all did remarkably well, and left Bay Mount in good health and free from any desire for the drug.

I am, Sir, yours faithfully,

STANFORD PARK.

Bay Mount, Paignton, S. Devon, Jan. 29th, 1927.

[1] THE LANCET, 1925, i., 334.

## TRAUMA AND TUMOUR.

*To the Editor of* THE LANCET.

SIR,—In reply to Sir Lenthal Cheatle, may I state that for some months I have been collecting cases of cancer arising in wounds received during the late war and so far have obtained three undoubted cases. Probably many more could be found, and I should be glad to obtain particulars of them. They are of interest as throwing light upon the length of the period of cancer induction in man. The subject of cancer arising in scars other than those due to burns is discussed in the *Cancer Review* (1926, i., pp. 108 and 183), Abstract 169, of a paper by Bang, and Abstract 327 of one by Iwamoto; and (1927, ii., p. 55) Abstracts 102 and 103 of papers by Tow and Itoh, and by Dubreuilh and Maginel respectively. Since the latent period seems to be from 12 to 40 years, it is still perhaps somewhat early to expect many cases of malignant disease arising from wounds received in the last war.

I am, Sir, yours faithfully,

H. J. B. FRY.

The Cancer Hospital, Fulham-road, London, S.W., Jan. 31st, 1927.

## A MUSEUM OF ECONOMIC BOTANY.

A COLLECTION of economic plants made by Dr. J. B. Hurry was formally handed over to the County Borough of Reading on Jan. 25th to form a permanent part of the municipal museum. Dr. Hurry's hobby of growing plants that minister to the welfare of mankind dates back twenty years or more, when he began to import specimens from various countries, especially from the tropics, compiling at the same time a museum of economic products derived from them. As time went on he accepted contributions from the Empire Exhibition, the Imperial Institute, the Royal Botanic Gardens at Kew, the Musée Colonial of Paris, and the Reading University. He was actuated by the feeling that botany is essentially a subject to be learnt from the life rather than from books, and that a collection of well-chosen specimens should be useful in cultivating the power of observation and stimulating the imagination of children of school age. In the new room of economic botany Dr. Hurry's collection is arranged under the seven sections of Food Products, Nuts, Fibres, Woods, Gums and Resins, Medicines, and Dyes, and apart from the exhibits there is a duplicate series in drawers of specimens which can be actually touched and examined. In a lecture on Economic Botany, which followed the formal opening of this room, the Headmaster of St. John's School, Reading, described the exhibition as a carefully conceived nucleus which should prove of considerable value for teaching purposes. It is no doubt well that the children of this country, who only see the limited flora of the temperate zone, should gain some acquaintance with the whole gamut of plants which provide food, clothing, shelter, fuel, light, health, or ornament in various parts of the British Commonwealth.

# The Services.

## ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. L. O. Hunt is placed on the Retd. List at his own request.

### ROYAL NAVAL MEDICAL RESERVE.

Surg. Sub-Lt. H. O'Connor to be Surg.

## ROYAL ARMY MEDICAL CORPS.

Majs. retiring on retd. pay: F. H. M. Chapman, J. L. Wood (and is granted the rank of Lt.-Col.), J. H. Gurley, and H. W. Farebrother (and is granted the rank of Lt.-Col.)

Capt. M. St. C. Hamilton, half-pay list, retires on account of ill-health, receiving a gratuity.

### ARMY RESERVE OF OFFICERS.

Col. A. J. MacDougall, late R.A.M.C., having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

Maj. F. A. Stephens, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

### TERRITORIAL ARMY.

Col. G. H. Edington, having attained the age limit, is ret. and retains his rank with permission to wear the prescribed uniform.

Lt.Col. H. G. L. Haynes, from the T.A. Res. of Off., to be Capt.

A. H. Whyte to be Lt.

## ROYAL AIR FORCE.

The undermentioned Flying Officers are promoted to the rank of Flight Lt.: C. G. J. Nicolls and B. Pollard.

The undermentioned are granted temporary commissions in the ranks stated on attachment to the R.A.F.: Flight Lt. E. Alston (Temp. Capt., General List, Army, Dental Surgeon); Flying Officer H. P. Sutcliffe (Temp. Lt., General List, Army, Dental Surgeon).

Flight Lt. H. J. Higgins (Capt., Army Dental Corps) relinquishes his temporary commission on return to Army duty.

Squadron Leader J. G. Worsley (Maj., Army Dental Corps) relinquishes his temporary commission on resignation of his Army commission.

## INDIAN MEDICAL SERVICE.

Lt.-Col. G. Tate to be Col.

Capts. to be Majs.: Bager Zainulabiedin Shah, A. J. D'Souza, R. H. Malone, Vinayak Narayan Agate, Jehangir Pestonjee Canteenwalla, Lonji Shahpurjji Modi, Satyendra Nath Mukerji, B. C. Ashton, Mani Shankar, Kaikhusru Byramji Bharucha, Erach Ruttanji Daboo, Hira Singh Anand, Bantwal Ganapathi Mallya, Burjorji Hormasji Kamakaka.

Temp. Lts. to be Temp. Capts.: Manoranjan Sen Gupta, Dattatraya Gangadhar Karandikar, Hemandas Pribhdas Manghirmalani, J. P. Arland, Mohindra Singh, Achanvittil Krishna Manon, Pukukotah Sreenivasachari Varadarajan, Diwan Chand Datta, Muthuswami Nata Rajan, Tonsa Panduranga Rao, and Muneebud Din Minhas.

Shankar Karunakar Menon, Tarachand Dayasing Shahani, Assa Singh, and Mohar Chandra to be Temp. Lts.

The King has approved the relinquishment of his temporary commission by Capt. S. Christian (who is permitted to retain the rank of Capt.).

The King has approved the grant of a temporary commission to Shankar Karunakar Menon, Tarachand Dayasing Shahani, and Assa Singh.

## DEATHS IN THE SERVICES.

Surg. Comdr. Alexander Gordon Andrews, R.N. (retd.), who died on Jan. 16th, entered the Royal Navy as a surgeon in 1884, and in the following year was appointed to H.M.S. *Monarch*. Later he served in the cruiser *Pylades* in Australia, and was staff surgeon of the *Terrible* during the South African War and the Boxer rising. He was present with the naval brigade at Tientsin. In 1903 he was appointed senior medical officer of the *St. Vincent*—boys' training ship at Portsmouth—and in 1904 took charge of the Royal Naval Hospital at Yarmouth. From 1909 he served in the battleship *Superb*, and from 1911 as fleet surgeon of the Dockyard, Malta. In 1914 he joined the battleship *Prince George* and in the following year was appointed for special service at Chatham. He retired in 1916.

DENTAL WORK IN BIRMINGHAM.—Last year at the Birmingham Dental Hospital there were nearly 36,000 operations. A new department for dental bacteriology was opened during the year.

# Medical News.

UNIVERSITY OF CAMBRIDGE.—At a recent Congregation the following degree was conferred:—

*M.B., B.Ch.*—R. T. Mummery.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An ordinary quarterly Comitia of the College was held on Jan. 27th, Sir John Rose Bradford, the President, being in the chair. The following candidates were admitted as members:—

Ahmed Khalil Abdel-Khalik, William Arthur Bourne, Hugh Nash Bradbrooke, John Alexander Charles, George Coelho, Thomas Reginald Davies, Charles Sydney Douglas Don, John Hartley Gibbens, William Gunn, George Stiven Halley, John Reginald Brock Hern, Alexander Mills Kennedy, Robert Albert Edward Klaber, Ardeshir Jehangirshah Kohiyar, Geoffrey Laurence Samuel Kohnstam, Robert Daniel Lawrence, Maurice Mitman, Edward Clark Noble, Robert James Valentine Pulvertaft, William James Reid, Olive Rendel, Navroji Kharshedji Sahiar, Lewis Herbert Savin, Kenneth Shirley Smith, Kenneth Andrew Soutar, Hilda North Stoessiger, Clara Dunbar Tingle, Robert Arthur Walsh, Robert Goege Ranyard West, Cecil Oswald Young.

Dr. W. C. Bosanquet, Dr. J. H. Sequeira, Dr. F. Craven Moore, and Dr. J. A. Nixon were elected Councillors to take the places of Dr. F. J. Poynton, Dr. J. H. Abram, Dr. T. Wardrop Griffith, and Sir Walter Morley Fletcher.—Sir Francis Champneys was re appointed a representative of the College on the Central Midwives Board.—The resignation of Sir Humphry Rolleston of the post of representative of the College on the General Medical Council was received, and a vote of thanks was accorded to him. Dr. E. Farquhar Buzzard was elected as his successor.—Dr. Stanley Barnes was appointed a representative of the College on the Court of Governors of the University of Birmingham in place of Dr. A. F. Voelcker, whose term of office expired on Dec. 31st, 1926.—Dr. J. H. Abram was reappointed a representative of the College on the Court of Governors of the University of Liverpool.—The resignation of Sir William Hale-White of the post of representative of the College on the Central Council for District Nursing in London was received, and Dr. A. S. Woodwark was elected in his place.—The acceptance by Mr. F. H. Maugham, K.C., of the post of Senior Standing Counsel to the College was reported.—The President announced that he has appointed Dr. J. F. Gaskell to deliver the Bradshaw Lecture for 1927, and that the Council have appointed Dr. F. A. E. Crew, of the Animal Breeding Research Department of Edinburgh University, to be Milroy Lecturer in 1928.—A communication was received from the Ministry of Health asking the College to nominate a representative to serve on an Advisory Committee of Clinical Experts to consider the details of the proposed alterations to be suggested by the British Government at the forthcoming Revision of the International List of Causes of Death, by the Health Section of the League of Nations at Geneva. Dr. Robert Hutchison was appointed. Dr. S. Monckton Copeman was appointed to represent the College at the Congress of the Royal Sanitary Institute to be held at Hastings from July 11th to 16th, 1927.—The President, Sir John Rose Bradford, was elected as a delegate to the celebration of the Lister Centenary in April, 1927.—A report was received from Sir John Broadbent, who represented the College at the celebration of the Centenary of Laennec in Paris in December, 1926.

At the same meeting of the Comitia licences to practise were conferred upon 126 candidates (21 women and 105 men) who have passed the recent Final Examination in Medicine, Surgery, and Midwifery of the Conjoint Board and have complied with the by-laws of the College. The following are the names and medical schools of the successful candidates:—

W. M. Abdel-Malek, Birmingham; G. M. Addison, Cambridge and St. Thomas's; J. C. B. Allen, Sydney and Middlesex; J. S. Alman, Berlin and Middlesex; H. Archer, Bristol; F. F. Augsburger, Lausanne; M. T. Aung, Guy's; G. C. Babington, St. Thomas's; D. H. Belfrage, Cambridge and St. George's; R. N. Bery and R. V. Bowles, Univ. Coll.; Winifred P. Brinckman, Bristol; A. H. Bruce, Guy's; S. M. Burrows, St. Thomas's; C. P. Campion, Cambridge and Univ. Coll.; Margaret E. M. Carter, St. Mary's; B. M. Clark, St. Bart.'s; H. H. Cohen, London; E. Colin-Russ, Middlesex; C. L. Cope, Oxford and Univ. Coll.; J. H. Couch, Toronto; Geraldine H. Cowie, Royal Free and Westminster; R. D. Curran, Cambridge and St. George's; C. Davies, Birmingham; J. Dean, St. Bart.'s; Daphne W. Dear, King's Coll.; J. H. A. Donelland, Cambridge and St. Bart.'s; A. O. Dreosti, St. George's; J. Ellison, Oxford and Leeds; D. K. Evans, Cardiff; Enid C. Evans, St. Andrew's and Westminster; E. S. Evans and F. M. M. Eyton-Jones, St. Bart.'s; A. P. Farmer and G. M. FitzGibbon, St. Thomas's; A. M. Fleming, Middlesex; A. B. Follows, Liverpool; Elsie G. M. Ford, Leeds; D. Gamsu, Durham; H. G. Garland, Leeds;

A. Golombek, King's Coll.; T. R. Griffiths and S. W. Hardwick, Cardiff and St. Bart.'s; W. V. Harke, St. Thomas's; N. A. Haworth, Charing Cross; Lilian M. J. Henry, Cambridge and King's Coll.; E. M. V. Hensman, Madras and Middlesex; Catherine E. Hill, Royal Free; H. E. Houfton, St. Bart.'s; Isabelle R. Humphreys-Owen, King's Coll.; K. N. Isherwood, Leeds; R. F. Jayne, London; A. C. Jepson, Cambridge and Guy's; T. M. Jones, Liverpool; V. Kathirgamatamby, Madras and London; M. S. Katre, Madras; F. Kellett, Cambridge and St. George's; A. B. Kettle, Guy's; P. N. Lahiri, Calcutta and Guy's; D. T. Lewis, Cardiff and Middlesex; I. N. Lewis, Cardiff and St. George's; E. W. Lindeck, Cambridge and Univ. Coll.; D. A. Llewellyn, St. Bart.'s; F. E. Loewy, Vienna and Middlesex; Joyce McConnel, Royal Free; W. S. Maclay, Cambridge and St. Bart.'s; E. McLellan, St. George's; G. McLoughlin, Liverpool; D. J. MacMyn, Cambridge and King's Coll.; M. Malk, St. Bart.'s; E. R. Matthews, St. Mary's; F. B. Matthews, Middlesex; J. W. Melville, Liverpool; R. L. Midgley, Univ. Coll.; I. A. Mills, Cardiff; Margaret Mitchell, Birmingham; J. K. Monro, Cambridge and London; W. C. Munro, St. Bart.'s; J. C. Neely, Oxford and Guy's; R. Nicklin, Birmingham; Joan Nixon, Univ. Coll.; W. C. W. Nixon and Mary O'Leary, St. Mary's; Greta K. Olsson, Westminster; Catherine J. Ormerod, Cambridge and King's Coll.; R. Pearce, Cambridge and St. Bart.'s; N. F. Pearson, King's Coll.; R. S. Pilcher, Univ. Coll.; T. J. Pittard, Cardiff and St. Bart.'s; L. J. G. Pitt-Payne, Guy's; Aileen M. S. Pollock, Royal Free and St. Mary's; J. C. C. Poole, Cambridge and St. Bart.'s; C. L. Potts, Cambridge and Birmingham; I. M. Preston, Manchester; W. P. Purvis, Cambridge and St. Thomas's; J. S. Rake, Oxford and Guy's; Marion Ravell, Royal Free; L. A. Richardson, Cambridge and St. Thomas's; N. Rizkalla, Manchester; Enid H. Rockstro, Univ. Coll.; E. E. F. Rose, Cambridge and St. Bart.'s; N. Rosen, Guy's; G. E. Rowan, St. Thomas's; A. H. Russell, Guy's; C. G. A. Sadler, St. Mary's; C. H. St. Johnston, Birmingham; T. F. M. Scott, Cambridge and St. George's; D. H. Smith, London; H. M. Soar, Charing Cross; R. Stanton, Westminster; Kathleen M. Stuart-Harris, Royal Free; C. N. Suter, St. Mary's; C. B. V. Tait, St. Bart.'s; H. Teitelbaum, Cardiff; H. D. Tonking, St. Thomas's; J. R. H. Towers, Cambridge and Leeds; C. G. Townsend, Cambridge and Guy's; A. G. Tribe and A. S. Wallis, St. Thomas's; Edith V. E. Whidborne, Cambridge and King's Coll.; N. J. Willans, Middlesex; G. P. Williams, Cardiff; W. D. Williams, London; R. W. Windle, Cambridge and St. Bart.'s; C. E. Woodrow, Cambridge and St. Bart.'s; and F. H. Woolley, Bristol.

A supplementary list of licentiates will be issued later for those candidates who had not completed their examination on Jan. 27th.

The undermentioned diploma was conferred (jointly with the Royal College of Surgeons) upon the following candidates:—

DIPLOMA IN OPHTHALMIC MEDICINE AND SURGERY.

M. Anton, T. R. Aynsley, Doris M. Baker, K. R. Chaudhri, M. Fine, Winifrede M. Fish, J. C. Gillespie, B. Gluck, B. Graves, J. W. Harris, H. N. Ingham, G. D. E. Jones, Edith M. F. McGill, H. D. Patel, N. N. Ray, A. H. S. Richardson, A. F. Senewiratne, T. Shukla, S. Singh, Caroline M. Stenhouse, and D. A. Williams.

Diplomas in Public Health, in Laryngology and Otology, and in Psychological Medicine were also conferred on candidates whose names have already been announced (THE LANCET, Jan. 22nd, p. 209).

SOCIETY OF APOTHECARIES OF LONDON.—At recent examinations the following candidates passed in the undermentioned subjects:—

*Surgery.*—G. W. Ayres, St. Mary's Hosp.; B. Best, Liverpool; N. S. J. Roberts (section II.), Bristol and Royal Free Hosp.; B. Rosenzvit, Middlesex Hosp.; M. T. Y. Selim, Liverpool; and W. D. Williams, London Hosp.

*Medicine.*—L. G. Apps, London Hosp.; L. O. Jaggassar, St. Mary's Hosp.; L. W. Rose, Guy's Hosp.; S. E. Tremellen, King's College Hosp.; and S. Wray, Manchester.

*Forensic Medicine.*—L. G. Apps, London Hosp.; W. A. A. Collington, Guy's Hosp.; S. E. Tremellen, King's College Hosp.; and E. H. Waller, Charing Cross Hosp.

*Midwifery.*—G. W. Ayres, St. Mary's Hosp.; P. V. Bamford, London Hosp.; R. Bobo, Paris; S. K. Rigg, Bristol; and K. Roberts, Liverpool.

The Diploma of the Society has been granted to the following candidates, entitling them to practise medicine, surgery, and midwifery: R. Bobo, L. O. Jaggassar, K. Roberts, S. E. Tremellen and W. D. Williams.

ROYAL INSTITUTION.—On Tuesday, Feb. 8th, at 5.15 P.M., Prof. Julian Huxley will lecture on Animal Growth and Development.

ROYAL STATISTICAL SOCIETY.—The Council of this Society will in 1927 award the Frances Wood Memorial Prize, value £30, for the best investigation, on statistical lines, of any problem affecting the economic or social conditions of the wage-earning classes. Particulars of the competition, which is only open to specified groups of candidates, may be had from the hon. secretaries of the Society, 9, Adelphi-terrace, London, W.C. 2.

UNIVERSITY OF LONDON.—At a meeting of the Senate held on Jan. 26th, Sir William Beveridge, the Vice-Chancellor, in the chair, the following appointments were made: Mr. H. L. Eason to represent the University on the General Medical Council; Sir William Collins to be a member of the Royal Sanitary Institute and Sanitary Inspectors' Examination Joint Board; Sir Holburt Waring to represent the University at the celebration of the centenary of the birth of Lord Lister, to take place in London on April 5th; and Dr. M. E. Delafield to be a representative (in respect of University College) at the Congress of the Royal Sanitary Institute at Hastings in July.

A course of three lectures (illustrated with lantern slides) on Allergic Diseases caused by Factors of Climate, will be given by Prof. W. Storm Van Leeuwen, of the University of Leiden, at St. Thomas's Hospital (Sherrington School of Physiology) on Monday, Tuesday, and Wednesday, Feb. 14th, 15th, and 16th, at 4 P.M. Admission free, without ticket.

*University College.*—A course of six public lectures on Reproduction will be given by Dr. A. S. Parkes at 5 P.M. on Mondays, Feb. 7th, 14th, 21st, and 28th, and March 7th, and 14th. Dr. E. D. Adrian will lecture on the Action of the Sense Organs on Wednesdays, Feb. 9th, 16th, and 23rd at 5 P.M.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—A meeting of this Society will be held at the Miller General Hospital, Greenwich, on Friday, Feb. 11th, at 8.45 P.M. Mr. Zachary Cope will give an address on Surgical Emergencies in General Practice.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.—The next quarterly meeting of the Association will be held on Feb. 16th at the Cheshire County Mental Hospital, Parkside, Macclesfield. Prof. T. H. Pear will read a paper on Recent Investigations on Visual Imagery with Special Reference to Hallucinations.

HAMILTON DRUMMOND MEMORIAL FUND.—A general meeting of the subscribers to this fund will be held in the library of the Royal Infirmary, Newcastle-upon-Tyne, on Feb. 7th, at 7.30 P.M., in order to approve a scheme for the memorial, to appoint trustees for the Fund, and an executive committee.

GENERAL LYING-IN HOSPITAL, YORK-ROAD.—The new building of the Post Certificate School will be opened by Mr. Neville Chamberlain, Minister of Health, on Tuesday, Feb. 8th, at 3.15, when the presentation will be made to Sir Francis Champneys, President of the hospital, by Mr. H. W. Lydall, the solicitor of the donor. Dr. John S. Fairbairn will take the chair and the ceremony will be followed by a reception.

CONDITION OF COUNTY CLARE HOSPITALS.—The Minister for Local Government in the Irish Free State is to be asked for a free grant towards putting certain of the hospitals in Clare into "fair condition." The Kilrush and Ennistymon hospitals under the County Clare Board of Health are officially stated to be "fast falling into ruin," while the County Hospital itself is "in urgent need of extensive repairs." Another institution is afflicted with a plague of rats which run about the wards, eat the nurses' clothing, and "make themselves at home in every room."

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Dr. W. M. Wanklyn will lecture for the Fellowship on Exanthemata with Special Reference to Small-pox, on Feb. 10th, at 5 P.M., at the house of the Medical Society of London, 11 Chandos-street, Cavendish-square. Mr. W. H. Trethowan will give a special demonstration in orthopædic surgery at the Royal National Orthopædic Hospital on Feb. 10th, at 3 P.M., and a special lecture on Causes and Treatment of Vomiting in Children will be delivered by Dr. C. C. Beatty at 3.15 P.M., at the Royal Northern Hospital on Feb. 15th. All these lectures and demonstrations are free to members of the medical profession. From Feb. 7th, for two weeks, the Paddington Green Hospital and the Victoria Hospital will jointly hold an all-day course in Diseases of Children, and beginning on the same date the London Lock Hospital will hold a four weeks' course in Venereal Diseases, consisting of clinical instruction in the out-patient department in the afternoon and evening and special lectures at intervals. The Royal Northern Hospital is undertaking a special course for practitioners for one week from Feb. 21st; lectures will be given in the afternoon and the rest of the time will be devoted to teaching in the wards and various departments of the hospital. The Fellowship arranges practical courses in anæsthetics and obstetrics, and arrangements can be made for clinical assistants. Syllabuses of Special Courses, the General Course Programme, and copies of the *Post-Graduate Medical Journal* may be had from the secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

ANTI-VENEREAL CAMPAIGN IN MANCHESTER.—The Manchester Public Health Committee is launching a campaign for the prevention and cure of venereal diseases. There will be two addresses daily in various public halls in the city from Feb. 14th to 19th; the one in the afternoon will be for women only, and the one in the evening for mixed audiences. Each address will be illustrated by cinema films, and there will be no charge for admission.

FURTHER EXTENSION OF QUEEN MARY'S HOSPITAL.—At the annual dinner of this hospital last week, Prince Henry, the President, stated that the out-patient department is the fourth largest in London and the maternity department the fourth largest in England. During the last four years three new wings have been erected at a cost of £120,000, and a fourth is now being built which will accommodate a solarium, an enlarged X ray department, and a new medical ward for children.

GIFT TO THE UNIVERSITY OF EDINBURGH.—The International Education Board of New York, one of the Rockefeller Foundations, has informed the University of Edinburgh that it is making a gift of £74,000, to be used as a contribution to the cost of a new department of zoology, to be created at the King's Buildings of the University at Craigmillar. Of this sum £38,000 is for building, £10,000 for equipment, and £26,000 for endowment. The University has £41,000 in hand for building, so that a total sum of £79,000 will now be available for this purpose. The University Court has gratefully accepted the gift, and the construction of the new department will begin at once.

ACTION AGAINST SURGEON FOR OPERATION WITHOUT CONSENT.—At the Liverpool Assizes on Jan. 27th a case was tried in which a patient sued Mr. St. George Wilson for negligence, and for performing an operation upon her without her consent at the Samaritan Hospital for Women. The statement made in court was to the effect that the patient was examined by Mr. Wilson at the hospital in October, 1923, and by arrangement returned the following day for examination under an anæsthetic. She was complaining of symptoms of cystitis of great urgency, and during his examination Mr. Wilson made up his mind that it would be wiser to establish free drainage of the bladder at once and thus avoid giving a second anæsthetic. When doing this he was unaware that the patient had not signed the permission book as the routine practice at the hospital requires; he had explained to her that a serious operation would be required for relief of the toxæmia from which she was suffering, but by some inadvertence no written consent had been obtained. A suprapubic cystostomy was performed, and five weeks afterwards the patient was transferred to a general hospital where a "hydronephrotic" kidney was removed. Owing to a peristent vesical fistula she still has to wear a suprapubic apparatus. Not until a year after operation was any complaint made, and a further period of two years elapsed before action was taken. At the hearing the plaintiff withdrew any suggestion that the operation had not been skilfully performed, but maintained that she had never consented to it, and that in fact she had not realised until some time later that it had been done. In answer to questions she said that if she had been told beforehand that an immediate operation was necessary she would have consented to it. Even if she had been brought out of the effect of the anæsthetic and had been told that an operation was imperatively necessary, she would have consented to go under a second anæsthetic again and be operated upon. She agreed that the initial operation had probably saved her life. Dr. H. H. McWilliam, senior medical officer of the Walton Infirmary, said that the operation had been necessary to save life. On the plaintiff's behalf Mr. Rice Jones said that the body of a man or woman was sacred, and no one had any right to meddle with it. So far back as 1767 it had been held that a surgeon ought not to operate without the patient's consent. It was necessary for a person to be told that an operation was about to be performed, in order that he or she might take courage or get a second opinion. Mr. F. A. Jeans, honorary surgeon at the Royal Infirmary, was called in Mr. Wilson's defence. He stated that so far as he could judge from the history he would have acted as Mr. Wilson had done, in the interest of the patient. He elaborated this point when a suppositious case was put before him by the judge, of a patient under an anæsthetic being subjected to an operation the necessity for which was only found in the course of the proceedings. Mr. Jeans pointed out that in such a case there was undoubtedly a clash between the interests of the patient and the interests of the surgeon. Mr. Justice Wright, addressing the jury, said that no surgeon, however well intentioned he might be, had any right to perform an operation without the consent of the person concerned. After a long retirement the special jury found for the defendant with costs, appending the rider "No doctor ought to operate without getting consent," to which the Judge added, "if it can be avoided."

Comment on this case will be found on p. 309.

UNIVERSITY OF MANCHESTER.—Dr. William Fletcher Shaw, who has been professor of obstetrics and gynæcology in the University since May, 1925, has been appointed to the chair of clinical obstetrics and gynæcology in succession to the late Prof. W. E. Fothergill. Dr. Daniel Dougal, who is at present lecturer in obstetrics and gynæcology in the University, has been appointed to the chair of obstetrics and gynæcology vacated by Prof. Fletcher Shaw.

Dr. Dougal was educated at the Manchester Grammar School and in the University of Manchester. He was awarded a gold medal for his M.D. thesis and is the author of many articles on obstetric and gynæcological subjects. He had a distinguished military career, and is at present Lieut.-Colonel and Commandant of the Second Western General Hospital. Before the war he was a demonstrator in anatomy in the University, and since 1920 has been continuously associated with the gynæcological department as demonstrator, assistant-lecturer, and lecturer. Among other appointments which he holds are those of honorary surgeon to the St. Mary's Hospitals for Women and Children, Manchester, and honorary gynæcological surgeon to the Manchester Royal Infirmary.

QUESTIONAIRE ON WHITE FLOUR.—The National Association of British and Irish Millers has issued a series of questions to over a thousand doctors in every county of England, Scotland, and Wales, the names being chosen at random from the Medical Directory. The Association is stated to be "desirous of obtaining representative and authoritative medical opinion on the value of the type of bread which has been evolved by the public requirements of many years, and for the making of which nearly all its mills are specially equipped." The circulated letter goes on to say that "in one or two cases, unfortunately, statements calculated to create the gravest alarm in the minds of the public have been made by distinguished members of your profession, active and retired. The millers desire to serve the public faithfully, and to give them good flour. It is apparent, however, that the intricate organisation of a great national industry cannot be dislocated by demands that may be merely transient—and which are probably unsupported by the medical profession as a whole—without serious results to the industry and to the poorer classes of bread buyers." The questions to be answered are the following:—

1. Do you concur in the statement made by the President of the New Health Society (*Daily Mail*, Oct. 21st, 1926), that "the curse of our age is that we are provided with white bread"?
2. Do you consider that, having regard to the average variety of diet now enjoyed by people in this country, white bread is a good and nutritious food?
3. Do you consider that white bread, as part of an ordinary mixed diet, is likely to lower the standard of national health?
4. Do you personally eat white bread?

It is not intended that in any circumstances the names of those sending replies shall be revealed.

## INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 22ND, 1927.

*Notifications.*—The following cases of infectious disease were notified during the week: Small-pox, 558 (last week 675); scarlet fever, 1455; diphtheria, 1019; enteric fever, 22; pneumonia, 1984; puerperal fever, 24; puerperal pyrexia, 136; cerebro-spinal fever, 11; acute poliomyelitis, 17; acute polio-encephalitis, 2; encephalitis lethargica, 32; dysentery, 4; ophthalmia neonatorum, 108. There was no case of cholera, plague, or typhus fever notified during the week.

The cases of small-pox were reported from the same counties as last week, with the addition of one case from Stafford (Stone R.D.), but Durham reported 313 instead of 349, and Yorks. West Riding, 161 instead of 266, the number of notifications from Sheffield being nearly 100 less than in the previous week. In Northumberland, however, 24 cases were notified as against 10 last week, 15 of them from Ashington.

*Deaths.*—In the aggregate of great towns including London, there was no death from small-pox, 2 (0) from enteric fever, 43 (0) from measles, 4 (1) from scarlet fever, 66 (32) from whooping-cough, 39 (9) from diphtheria, 44 (10) from diarrhœa and enteritis under 2 years, and 470 (197) from influenza. The figures in parentheses are those for London itself. The influenza deaths for the last six weeks have thus been 60, 69, 86, 173, 326, 470—and 725 has been given verbally as the figure for the next week.

# Medical Diary.

*Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.*

## SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
TUESDAY, Feb. 8th.—5 P.M., THERAPEUTICS AND PHARMACOLOGY. Dr. J. W. Trevan: Chemical Constitution and Pharmacological Action. Other papers will be read. 8.30 P.M., PSYCHIATRY. Joint paper: Dr. T. A. Ross and Dr. R. D. Gillespie: Progression and Regression in Two Homosexuals.
WEDNESDAY.—5 P.M., SURGERY: SUBSECTION OF PROCTOLOGY. Discussion on Diverticulitis. Opening speakers: Dr. Edmund Spriggs (Medical), Sir Charles Gordon-Watson (Surgical), Dr. Bertram Shires (Radiological). The Discussion will be continued by Dr. T. de Martel (Paris) and others.
THURSDAY.—8.30 P.M., NEUROLOGY. Paper: Dr. E. Arnold Carmichael: Optic Nystagmus.
FRIDAY.—LIBRARY: The Library will be open until 10 P.M. 5.30 P.M., CLINICAL. (Cases at 5 P.M.) 8.30 P.M., OPHTHALMOLOGY AND NEUROLOGY. Special Discussion: The Value of Recent Methods of Treatment in the Late Stages of Ocular Syphilis, to be opened by Mr. J. H. Fisher and Dr. J. P. Martin. The following will also take part in the Discussion: Sir Arnold Lawson, Dr. A. Felling, and Mr. S. H. Browning.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Feb. 7th.—8.30 P.M. Discussion on Poliomyelitis, to be introduced by Dr. Francis M. R. Walshe and Prof. J. McIntosh, followed by Sir Thomas Horder.

BIOCHEMICAL SOCIETY.
MONDAY, Feb. 7th.—5 P.M. (in the Lister Institute of Preventive Medicine, Chelsea Bridge-road, S.W.). Communications: C. Dorée and E. C. Barton-Wright: A New Type of Alkali Lignin. F. Dickens, E. C. Dodds, W. Lawson, and N. F. Maclagan: Observations on the Purification and Properties of Insulin. P. Eggleton and M. G. Eggleton: The Significance of Phosphoric Acid in Muscular Contraction. I. Smedley MacLean and C. G. Daubney: The Lipins of Yeast. W. T. J. Morgan: Methylated Derivatives of Hexosephosphoric Acids. A. Harden: Meyerhof's Theory of Alcoholic Fermentation. L. F. Hewitt: Proteins of the Cerebro-Spinal Fluid. M. H. Roscoe: Nitrogen Metabolism Technique for Use with Small Animals. H. W. Southgate: An efficient Gas Scrubber. O. Rosenheim and T. A. Webster: On the Nature of Provitamin D. J. R. Marrack: The Effect of the Reaction on the Osmotic Pressure of Serum Proteins. The following exhibits and demonstrations will also be shown from 3.30 to 4.30 P.M.: W. T. J. Morgan: Apparatus for Pregl's Methods of Micro-Analysis. T. Lumsden and A. C. Kohn-Speyer: Simplified Method of Tissue Culture. F. M. Burnet: Bacteriophage Phenomena. M. Rhodes: National Collection of Type Cultures. Strains Employed in Industry. N. S. Lucas: Apparatus for Determining the Coefficient of Absorption of Ultra-Violet Rays for Skin.

## LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Feb. 7th.—10 A.M.: Mr. MacDonald: Genito-Urinary Operations. 2 P.M., Mr. Addison: Surgical Wards. 4 P.M., Mr. Addison: Surgery of the Stomach and Duodenum.
TUESDAY.—10 A.M., Medical Registrar: Clinical Methods. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.
WEDNESDAY.—10 A.M., Dr. Owen: Medical Diseases of Children. 2 P.M., Dr. Scott Pinchin: Medical Out-patients. 2.30 P.M., Mr. Armour: Surgical Wards.
THURSDAY.—12 noon, Mr. Simmonds: Demonstration of Fractures. 3 P.M., Sir Henry Simson: Gynæcological Wards. 4 P.M., Dr. Snowden: The Conversion Neurosis.
FRIDAY.—11 A.M., Dr. Pritchard: Modern Methods in Medicine. 2 P.M., Mr. Sinclair: Surgical Out-patients. 4 P.M., Dr. Owen: Heart Disease in Infancy and Early Childhood.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Mr. Banks-Davis: Operations of the Throat, Nose, and Ear.
Daily.—10 A.M. to 5 P.M., Operations, Medical, Surgical, Special, Out-patient Departments (Saturdays 10 A.M. to 1 P.M.).

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Feb. 7th, to SATURDAY, Feb. 12th.—FELLOWSHIP OF MEDICINE. Special lecture at the Medical Society, 11, Chandos-street, W., at 5 P.M., on Thurs. 10 P.M.: Dr. W. M. C. Wanklyn: Exanthemata with Special Reference to Small-pox. Open to all members of the medical profession without fee.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, Great Portland-street, W. Special demonstration on Thurs. at 3 P.M., by Mr. W. H. Trethowan. Open to all members of the medical profession without fee.—COMBINED COURSE IN CHILDREN'S DISEASES, Paddington Green Hospital and Victoria Hospital. All day course.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Special course in Dermatology. Daily instruction in Out-patient Department. Lectures twice weekly.—LONDON LOCK HOSPITAL, Dean-street, W. Special course in V.D. Afternoon and evening clinics daily with formal lectures.—NATIONAL HOSPITAL, Queen-square, W.C. Special course in Neurology. Daily instruction and special lectures. Further information from the Secretary.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Feb. 7th.—10 A.M., Surgical Clinic. 2 P.M., Medical Cases in the Wards. 2.30 P.M. to 5 P.M., Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 P.M. to 5 P.M., Medical, Surgical, Throat, Nose, and Ear Clinics. Operations.
WEDNESDAY.—2.30 P.M. to 5 P.M., Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M., Dental Clinic. 2.30 P.M. to 5 P.M., Medical, Surgical, and Ear, Nose, and Throat Clinics. Operations.
FRIDAY.—10.30 A.M., Throat, Nose, and Ear Clinics. 2.30 P.M. to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

NATIONAL HOSPITAL FOR DISEASES OF THE NERVOUS SYSTEM, Queen-square, W.C.
MONDAY, Feb. 7th.—2 P.M., Dr. Hinds Howell: Out-patient Clinic. 3.30 P.M., Dr. Riddoch: Mental Sequelæ of Encephalitis Lethargica.
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Risien Russell: Syphilis as it Affects the Nervous System.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Walshe: Poliomyelitis.
FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M. Mr. Elmquist: Demonstration of re-education Methods in Exercise Room.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Feb. 10th.—4 P.M., Dr. Donald Paterson: Care and Feeding of Premature Infant.

ROYAL NORTHERN HOSPITAL POST-GRADUATE COURSE.
TUESDAY, Feb. 8th.—3.15 P.M., Dr. F. D. Saner: Lecture Demonstration on Fractures.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Feb. 8th.—5 P.M., Dr. E. Graham Little: Lichen Planus.
THURSDAY.—5 P.M., Dr. J. E. M. Wigley: Lupus Erythematosus.

ROYAL DENTAL HOSPITAL SCHOOL OF DENTAL SURGERY, Post-Graduate Lectures.
WEDNESDAY, Feb. 9th.—5.30 P.M., Mr. E. Rhodes: Interpretation of Dental Radiographs.

PEOPLE'S LEAGUE OF HEALTH. (Sims Woodhead Health Lectures).
MONDAY, Feb. 7th.—6 P.M. (at the Medical Society of London, 11, Chandos-street, W.). Dr. L. R. Shore: Anatomy and Physiology.

ST. MARGARET'S HOSPITAL FOR WOMEN, Acomb-street, Whitworth Park, Manchester.
WEDNESDAY, Feb. 9th.—4.15 P.M., Mr. A. C. Magian: Sterility and its Cure.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
FRIDAY, Feb. 11th.—3.30 P.M. (at the Royal Hospital). Dr. Naish: Clinical Cases.

# Appointments.

ADDIS, W. ROBERT, M.B., Ch.B. Edin., has been appointed Honorary Assistant Surgeon, St. Mary's Hospitals, Manchester.

AINSCOW, GLADYS E., M.B., Ch.B. Birm., D.P.H., Assistant Medical Officer of Health for Maternity and Child Welfare, Leeds.

BROCKBANK, W., M.A., B.Ch. Camb., M.R.C.P. Lond., Resident Medical Officer, Manchester Royal Infirmary.

BURT-WHITE, H., F.R.C.S. Eng., Hon. Obstetric Surgeon to the London Female Lock Hospital, Harrow-road, W.

HEWER, C. LANGTON, M.D. Lond., F.R.C.S. Eng., a Member of the Honorary Medical Staff of the Queen's Hospital for Children, E.

THOMAS, H. E., L.R.C.P. Lond., M.R.C.S., House Surgeon to Swansea Hospital Board.

VLASTO, M., M.B. Lond., F.R.C.S. Eng., Surgeon to the Ear, Nose, and Throat Department, West London Hospital.

Royal West Sussex Hospital: BROOKE, R., M.B., B.S. Lond., F.R.C.S. Eng., and GOUGH, J. H. H., M.R.C.S., L.R.C.P. Lond., Hon. Assistant Surgeons.

Certifying Surgeons under the Factory and Workshop Acts: WRANGHAM, J. M., M.B., B.Ch. Camb. (Ripponden, West Riding); MILNER, E. H., M.B., Ch.B. Leeds (Driffield, East Riding).

# Vacancies.

*For further information refer to the advertisement columns.*

*Aylesford, Kent, Hospital and Sanatorium, &c., for Tuberculosis Ex-Service Men.*—Jun. P. £100.
*Bristol Eye Hospital.*—H.S. £150.
*Bury and District Joint Hospital Board.*—Asst. Med. Supt. £400.
*Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.*—Res. H.S. At rate of £75.
*Derby, Derbyshire Education Committee.*—School Dentist. £500–£550.
*East London Hospital for Children and Dispensary for Women, Shadwell, E.*—Surg. and Asst. Surg.
*Evelina Hospital for Children, Southwark, S.E.*—X Ray Worker. £160.
*Gloucester, Gloucestershire Royal Infirmary.*—H.P. and Asst. H.S. At rate of £150 and £120 respectively.
*Hospital for Sick Children, Great Ormond-st., W.C.*—Cas. O. £400.
*Inverness, Northern Infirmary.*—Jun. Med. Res. £100.
*King's College Hospital, Denmark Hill, S.E.*—Jun. P. for Dis. of Skin.
*Liverpool, Royal Children's Hospital.*—Res. M.O. At rate of £150. Also Two Res. H.P.'s and two Res. H.S.'s. Each at rate of £60.
*Macclesfield General Infirmary.* Hon. Ophth. S.
*Manchester, Ancoats Hospital.*—Asst. Surg. Reg.
*Manchester, St. Mary's Hospital, Whitworth Park.*—Res. Surg. O. £200.
*New Zealand, Dental Hospital Dept.*—Sen. Asst. M.O.'s. At rate of £775.
*Queen's Hospital for Children, Hackney-road, E.*—Res. M.O. £200. Also H.P. and H.S. Each at rate of £100.
*Royal Free Hospital, Gray's Inn-road, W.C.*—Asst. Phys.
*Royal Ear Hospital, Huntly-street, W.C.*—Registrar. £50.
*Royal Northern Hospital, Holloway, N.*—Res. M.O. £200. Also H.S. At rate of £70.
*Ryde, Isle of Wight, Children's Hospital and Maternity Home.*—Res. M.O. At rate of £100.
*Scottish Board of Health.*—Dist. M.O. £1000.
*Stoke-on-Trent City.*—M.O.H. £1400.
*Stoke-on-Trent, North Staffordshire Royal Infirmary.*—Radiologist. £500.
*Sudan Government, Wellcome Tropical Research Laboratories, Khartoum.*—Asst. Bacteriologist. £660–£720.
*University College Hospital, Gower-street, W.C.*—Hon. Associate P. and S.
*Willesden Urban District Council,*—Asst. M.O. £600.

The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons: Stewarton (Ayrshire), Bilston (Staffs), Godalming (Surrey), Presteign (Radnorshire), Silsden (Yorks, W. Riding), and Williton (Somerset).

# Births, Marriages, and Deaths.

## BIRTHS.

BATE.—On Jan. 28th, at Fourth-avenue, Hove, the wife of Geoffrey Bate, F.R.C.S.E., of a daughter.

## MARRIAGES.

BEVAN—COMBE.—On Jan. 22nd, at St. Peter's Church, Brockley, Frank Arthur Bevan, M.B., B.S., to Mary, elder daughter of the late Charles E. Combe, L.D.S., and Mrs. George Read, of Holly Bank, Adelaide-road, S.E.

DAWSON—PATON.—On Jan. 29th, at St. Matthew's Church, Denmark Hill, Dr. Wm. S. Dawson to Gladys Lyle Paton.

KENNEDY—HART.—On Jan. 26th, at St. Laurence Church, Measham, Leicestershire, George Rollo Kennedy, M.B., Ch.B. (Edin.), of Claverley, Salop, to Mary Hampton, only daughter of the late Dr. G. S. Hart and Mrs. Hart, and granddaughter of the late Dr. J. W. Mulligan, of Abersychan, Mon.

PORTER—FRANCE-HAYHURST.—On Jan. 26th, at St. Peter's, Wrockwardine, Wellington, Salop, Cecil Petvin Porter, M.B., Ch.B., of Kidderminster, to Cecily, younger daughter of the late Rev. Hesketh France-Hayhurst and Mrs. France-Hayhurst.

## DEATHS.

BRADSHAW.—On Jan. 25th, at The Tower, Mold, Thomas Robert Bradshaw, M.D., F.R.C.P., late of Rodney-street, Liverpool, aged 69.

ELLIOTT.—On Jan. 26th, at his residence, "Cranford," South drive, St. Anne's-on-the-Sea, Arthur Campbell Elliott, M.B., C.M., M.B.E., aged 61 years.

FLETCHER.—On Jan. 26th, John Corbet Fletcher, M.D., C.M., aged 84.

FLETCHER.—On Jan. 29th, after long illness, Martha Parker Fletcher, for 51 years beloved and devoted wife of the late John Corbet Fletcher, aged 73.

FRY.—On Jan. 29th, at Brentwood, Langley-road, Surbiton, John Farrant Fry, L.R.C.P. Lond., M.R.C.S. Eng., aged 74.

HOSFORD.—On Jan. 24th, at 37, Richmond Hill, Thomas Stroud Hosford, M.R.C.S., L.R.C.P., aged 83.

*N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.*

# Notes, Comments, and Abstracts.

## RADIOGRAPHY AS IT AFFECTS THE ASSURABILITY OF OPERATORS.[1]

BY STANLEY MELVILLE, M.D. BRUX., M.R.C.S. ENG.,
BARRISTER-AT-LAW; RADIOLOGIST, ST. GEORGE'S HOSPITAL AND HOSPITAL FOR DISEASES OF THE CHEST, BROMPTON.

IT has been my lot to try to do something for the greater safety of the X ray worker and I hope to demonstrate to you that, under certain know conditions, such a life is a perfectly suitable risk. Ten years ago, even six years ago, I dared not have suggested such a thing. All who have been injured (so far as my investigations have carried me) received their injuries before we had any definite knowledge as to the precise nature of the injuries or how to combat them. Even the physical nature of X rays was, until recently, much in dispute. Only within the last year have we known that they are ether waves or disturbances of the ether akin to light, but with a wave length some 10,000 times less than similar disturbances known as light.

Until quite recent times, too, most if not all X ray work has been carried out in small ill-ventilated rooms and with very inadequate or no protection.

I think it may be well if I direct attention to the discussion of the two main points: (1) the effect of X rays upon the tissues and upon the blood; (2) the present position as regards protection.

### (1) *Effect upon the Tissues.*

The chronic radio-dermatitis of X ray operators is the result of small frequently repeated doses, the first effect of which is a stimulation of epithelial growth. The result of this is that the skin becomes dry and hard with the formation of warty growths. Changes in the blood-vessels take place and the exposed parts (especially the dorsum of the hands) become red and mottled. At a later stage in some few cases, ulceration has taken place which has developed into a carcinomatous growth. In the "Acta Radiologica" Amundsen in 1924 published the results of his investigations lasting over a number of years on the blood of an X ray staff. He found that there was a definite deviation from the normal in the whole of the personnel as follows: (1) diminution in the actual number of white cells; (2) reduced percentage, especially of the polymorphonuclears; (3) no alteration in the hæmoglobin. He found that the blood picture definitely improved after a period of cessation from work but especially *after the protective arrangements had been improved*, the latter a most important point, as I shall hope to show you.

As a result of innumerable counts made in many institutions all over the country the following has, I think, been established. Over-exposure under faulty working conditions shows the following changes: (*a*) invariable leucopenia, the white cells falling to less than 50 per cent. of the normal, the reduction falling chiefly upon the polynuclear leucocytes and the lymphocytes; (*b*) following this, a gradual decrease in the total number of the red blood corpuscles and in the hæmoglobin percentage. With undue radiation (and especially where the bone-marrow or the spleen has received the chief dosage) a much more serious condition has been recorded. Severe aplastic anæmia ending in death was seen in certain of the workers at the Radium Institute and among private persons who were engaged in either radium or X ray work.

I come now to the second and, to my mind, the more hopeful part of my paper.

### (2) *The Present Position as Regards Protection.*

In 1920 the problem of adequate protection had assumed large proportions. Not only were there some definite cases of aplastic anæmia among the workers at the Radium Institute, but in the same year there occurred the untimely death of Ironside Bruce, a comparatively young and energetic radiologist, from the same dire complaint. About that time, having heard a rumour to the effect that there was likely to be a great crusade by the Press against the use of X rays and radium, I determined to get something started by way of counterblast. I found all my colleagues in agreement to organise the X ray and Radium Protection Committee. We were fortunate in getting as our Chairman, Sir Humphry Rolleston. The committee was thoroughly representative of British radiology, the members being in the first instance elected by the Rontgen Society, the Electro-therapeutic Section of the Royal Society of Medicine, and by the British Association for the Advance-

[1] An address read to a meeting of the Assurance Medical Society on Jan. 5th.

ment of Radiology and Physiotherapy. Dr. J. C. Mottram joined us as representing the Radium Institute, and he undertook the investigation into the blood condition. Prof. S. Russ represented the Institute of Physics, and the National Physical Laboratory was represented by Dr. G. W. C. Kaye, to whom we owe a very great amount of the experimental work upon which the report was finally built.

No committee ever worked harder or more harmoniously. The energy of our Chairman was most infectious and not infrequently he required us to meet more than once a week. In due course two reports were drawn up. They are very thorough and deal not only with the question of adequate protection for the operator, but with such important questions as working hours, holidays, fresh air, ventilation and construction of X ray rooms. The introduction to the report reads as follows :—

"The danger of over-exposure to X rays and radium can be avoided by the provision of efficient protection and suitable working conditions."

At first, there was consternation among the manufacturers, for this country was the first to insist upon the need for protection—that is to say, protection based upon experiment and reasonably adequate. The manufacturers had their working designs which were totally inadequate for the additional weight of protective material demanded. Without a moment's hesitation, as though infected by the spirit of the committee, they scrapped their designs, brought out new forms of apparatus, in every respect up to the standard set up by the committee and the tests of the National Physical Laboratory. In no other country would such a thing have been possible without definite legislation. The Ministry of Health, too, took up the matter and wherever it had control or could exercise persuasion, the standard set up by the committee was ordered or advised. It is doubtful if to-day you could buy any apparatus in this country, at any rate of British manufacture, that does not bear the imprimatur of the committee.

Finally, the Home Office invited us to express an opinion on the question of including certain diseases and injuries in the Schedule under the Workmen's Compensation Act, 1906.

Russia has quite recently passed some very stringent laws for the protection of X ray workers. These regulations are issued under the authority of the Commissariat of Labour and deal with hours of work, which are limited to four hours a day, and also lay down definite rules much on the lines of our committee, but they require each worker to be given at least six weeks' holiday a year, preferably in two halves. They provide also for systematic medical inspection of all X ray workers.

*Some New Facts.*

In conclusion, I would ask you to look at some few facts which I have been able to bring forward as evidence of the immediate result of protection. The following have been given to me by Dr. Mottram :—

1. Lymphocyte count of the staff of the Radium Institute in 1919 gives an average of 1697 compared with an average count of a number of controls of 2751.

2. Polymorph count also of the staff of the Radium Institute in 1919. Here again the average of the staff was 2991, compared with the average of the controls which was 6162. In both cases the controls were taken from the *Journal of Experimental Medicine*.

3. White blood count of the staff of the Radium Institute *after increased protection*, which began in 1919. This table gives a count of total white cells in thousands per c.mm. In 1919 the average was 4000, and it steadily rose until in 1926 it reached the steady figure of nearly 7000.

Prof. Russ has lent me a chart recording systematic red and white count of two members of the staff employed at the Middlesex Hospital in the radium department. They have been remarkably steady for some years.

I have received a number of letters regarding the question which we are discussing to-day :—

Mr. Cecil Rowntree, whose Hunterian lecture at the Royal College of Surgeons in 1909 was on the subject of X ray carcinoma, writes : "I think it would be quite right to say that we need not anticipate further cases, having regard to the fact that burns and dermatitis are now practically unknown."

Dr. Mottram is even more definite. "Anyone who burns himself nowadays in the handling of radium is a suicide, and as such he ought to be dealt with under this clause in his policy." Dr. Kaye writes that he is quite convinced that, providing the recommendations of the committee are obeyed, the risk to the operator is absolutely negligible from the physical standpoint at least. He makes the following significant remark "It is difficult to do anything for the fool who calmly lights a cigar while sitting on a gunpowder barrel." Dr. Gilbert Scott, in sending me the statement of Dr. L. Ash, who systematically makes blood counts on the X ray staff of the London Hospital, states that so far as the total blood cells (red and white) and the differential counts are concerned, there is no change of importance in the present as compared with previous years.

I have now put to you the position as far as my own knowledge and investigation allow me. I am convinced in my own mind that the very earliest indication of undue irradiation is shown in the state of the blood, and that this should be made the basis of investigation in any proposal for life insurance. Naturally, one who already has a definite dermatitis, with the possible risk of skin carcinoma, is not a fair risk, though there are very many people who have on the hands X ray warts from exposure years previously, but who, under present day protection, are fit and well and have no extension of the trouble ; they have learned their lesson.

## THE HYGIENE OF TRAMP STEAMERS.

FOR his presidential address to the Services Group of the Society of Medical Officers of Health, on Jan. 27th, Dr. J. Howard-Jones, M.O.H. of Newport (Mon.), took as his subject, Sanitation in the Merchant Marine, limiting himself to the tramp steamers of 300 tons and upwards. Sanitation afloat was, he said, hampered by the division of responsibility ; the port medical officers were responsible when the ship was in use, but the Board of Trade, though it had no doctor on its staff, passed the plans, and it was consequently difficult for the medical officer to get carried out on new ships the alterations that were necessary to provide good ventilation or other needed hygienic requirement. The seamen of some foreign, especially Scandinavian, nations had by law better accommodation than had British seamen, so ships sold to those nations or to some of our colonies had to be pulled to pieces and the crew accommodation enlarged before they were allowed to go to sea under their new flags. We had lost our pride of place as showing the world the best hygiene there was in ships. For the dirty conditions on board the men were themselves responsible. At the close of his address an informal conversation arose, in which the Board of Trade was criticised by some, but Dr. W. M. Willoughby, speaking for the Port of London, thought the Board had done well, in this present time of unemployed seamen, in causing as little expense as possible to ship owners. Dr. A. Elder was satisfied with the action of the Board, which had adopted, without delay, all the improvements he had asked for in his book. He thought men were less clean than before the war ; they did not use baths when these were available, not even when hot water was supplied. Differing from Dr. Willoughby, he thought firemen kept their quarters cleaner than sailors. Fleet-Surgeon W. E. Home said that, thanks to the work of Dr. Howard-Jones and his associates in the last 20 years, seamen were now housed much better than formerly, as he had had recent occasion to observe. The men must learn to keep their quarters clean ; he had never seen such a heavy infection with bugs as in a ship recently. It was stated by an Australian doctor present that 120 cub. ft., the statutory cubic space per man, covered in England both sleeping and living accommodation for the men (mess-room, bath-room, &c.), but the whole 140 cub. ft. for Australian seamen must be given to their sleeping quarters. Prof. H. R. Kenwood remarked that if things were as reported in that room the Board of Trade did not appear to realise that good hygiene paid. It was desirable to convince the Board, and he sketched how this might be done. Dr. Andrew Balfour asked how it was that other countries had gone ahead in their regulations. Was it that their men would not go to sea in bad hygienic conditions ? No one provided an answer to this question, but it was suggested that bad hygiene and dirt kept good men away from the sea, and that the want of these good men lowered the average self-respect. Fines may be imposed on seamen by the captain of a ship for keeping crew spaces dirty, but the Board of Trade, so it was stated by Dr. Howard-Jones, discourages insistence on these fines.

At the end of last week an outspoken debate on the question of seamen's working hours took place at the International Labour Office at Geneva. Wide difference was expressed as to the need or expediency of making international regulations, but it is clear that sailors' organisations are alive to the necessity for ensuring that the conditions of service should be improved.

*Webster's Test for T.N.T. in Urine.*—We have been asked to state that the discoverer of this test was not the late Mr. John Webster.

SHEFFIELD HOSPITALS AND THE COAL STRIKE.—It was stated at the annual meeting of the Sheffield Hospital Fund Committee that the seven months' coal stoppage had resulted in a fall of £19,500 in the revenues of the Sheffield hospitals.

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# Personal Observations
UPON THE
# CLINICAL FEATURES OF POLIOMYELITIS.

*An Address delivered before the Medical Officers of Schools Association on Feb. 4th, 1927,*

BY JAMES COLLIER, M.D., F.R.C.P. LOND.,
PHYSICIAN TO ST. GEORGE'S AND THE NATIONAL HOSPITAL, QUEEN-SQUARE.

IT has been intimated to me that it would be as well for me to deal chiefly with the clinical aspect of this malady and I think the suggestion was wise; for a clinical observation well recorded always stands the test of time. Nothing ever upsets it or makes it wrong. It never leads us astray. And every one of us, however little opportunity we may have had for observing this disease, may, from the observation of a single case or a few cases, make a record of a hitherto unobserved fact with an important bearing. Upon the pathological aspect of this disease there is little that I could tell you which is not available to you in modern text-books. There is an admirable summary in the Lumleian Lectures for 1916 by the late Dr. F. E. Batten, and since this work was published little except further confirmation of the views therein contained has been added, except the separation of the cases of the then undescribed "lethargic encephalitis," a few of which had crept into the cases described by Batten as cases of poliomyelitis. The epidemiological and public health aspect of the malady bristles with difficulty and potential danger, with ignorance and paradoxes.

## DEVELOPING KNOWLEDGE OF THE DISEASE.

When I first entered upon medical studies 40 years ago there was no suggestion that poliomyelitis was an infectious disease. Twenty-two years ago Wickman proved that it was infectious by human contact only, and I think that his proof remains unshaken. Now some of us think that poliomyelitis is not infectious so far as case to case infection is concerned, and that the future is likely to prove that only recent carriers can spread the disease. There are many known facts and one has to marshal these epidemiological facts into some sort of working order. One has, in fact, to make an hypothesis which will best fit in with the facts, and in so doing I have no doubt that the truth gets squeezed and distorted a bit and we are apt to turn a blind eye upon an obvious truth which does not fit in with the hypothesis. But such an hypothesis, though most necessary and useful for the working moment, is apt to melt into thin air at the touch of a little more knowledge.

We know well what poliomyelitis has done in the past, but who can say what it may do in the future? Will it disappear silently while we sleep and suddenly as chlorosis did all of one day from London Town where it had been endemic for centuries? Or will it treat us to an American epidemic? I suggest to you that it is not likely to play terrible havoc, unless it disappear first of all. For we always have poliomyelitis in London every month of every year and are therefrom, I submit, a "salted" community. Which of us who gained our knowledge of poliomyelitis long ago would have then believed it possible that in one relatively small district of the world 50,000 cases could have occurred in the space of a few years, culminating with some 20,000 cases, 5000 deaths, and 12,000 cases of paralysis in one autumn, in New York State in 1916; or that, in one small and isolated village in the west of England with a total population of 119 souls, 45 were seized with poliomyelitis in the space of a few days, every house having its two, three, or four victims—two of them being 46 years of age? This was in the Cornwall and Devon outbreak of 1910. Every form of the disease was seen in that village in that week. I will ask you now to contrast this outbreak in Stoke Rivers village with another outbreak which occurred in the same year in the highly populous town of Edinburgh. There were, I think, 62 cases all of the usual spinal type. There were no abortive cases. No two cases occurred in any one family or in any one street. Case contact or family contact could be absolutely excluded in all but three of the cases. Headache only occurred in six of the 62 cases. The contrast is very striking. Forty-five cases out of 119 people with every type of the disease in the one case with clear contact in every case; and 62 cases in 420,000 with one type of the disease and with contact absolutely disproved in nearly all the cases in the other. These two epidemics were reported on the same evening before the Epidemiological Section of the Royal Society of Medicine and the attitude of the audience was very different to the two reporters. They patted the Devon and Cornwall man on the back and said his was excellent work. Certainly he had a very inspiring experience and had managed to get the help of Levaditi in Paris and had the virus of his epidemic proved. Moreover, the little village outbreak to which I have referred was only one of many local outbreaks which he was able to observe. But the audience were positively rude to the Edinburgh man. They said his report was not worth listening to, and that from an epidemiological point of view it was of little value, and even suggested, I think, that if he had had the capacity of looking properly, he would have found abortive cases and would have done more successful tracing. I suggest to you that both these reports were of the highest interest as examples—the one of poliomyelitis running riot in a susceptible community following a carrier epidemic; the other of poliomyelitis, epidemic upon a highly salted community with multitudinous carriers. I have put them before you to impress you as strongly as I can of the vagaries and possibilities of this disease and to hint at a possible explanation.

## THE CEREBRO-SPINAL FLUID.

Dr. J. G. Greenfield, our distinguished pathologist at Queen-square, will tell you that he will put us right about the diagnosis of poliomyelitis in the acute stage from his examination of the cerebro-spinal fluid in 100 per cent. of our cases. I think 98 per cent. would be a more just estimate. Lumbar punture is therefore a most helpful measure in making a correct diagnosis of poliomyelitis from the earliest appearance of the symptoms until several days after pyrexia has disappeared. It is also often a dramatic means of removing, and permanently removing, some of the most distressing symptoms such as the headache and head retraction and the bodily pains and sometimes it seems to relieve the pyrexia immediately. Whether its performance and repetition have any effect in lessening the severity of resulting paralysis or averting death I cannot say, but what I can say is that it does no harm and can always be performed without any distress to the patient whatsoever, if a fine hypodermic needle and a few drops of 2 per cent. novocaine solution are previously employed.

Just now and again lumbar puncture fails you in the diagnosis of poliomyelitis. May I give you the bare details of two such happenings which have occurred to me recently.

The first was that of a lad, returned from public school as a contact. Forty-eight hours after leaving school and when playing golf he was seized with a severe headache. I saw him that evening with a temperature, a pink skin and headache, nystagmus and head retraction, and with the right abdominal reflexes and the deep reflexes of the legs absent. The lumbar puncture gave a completely negative result. The M.O.H. was notified by the doctor before we knew about the C.S.F. The M.O.H. subsequently pressed me to certify this case personally as it concerned a public controversy. The patient was by this time apyrexial and convalescent, and I was in a bit of a tight place for an absolute proof of my diagnosis, so I did another lumbar puncture and found the C.S.F. quite typical of poliomyelitis.

Do not let this case lead you to suppose that the fluid when normal early on always becomes diagnostic later. Here is the disproof :—

I saw recently a little girl on the fourth day of her illness with the pyrexia almost gone and practically convalescent. I pronounced this case to be a typical abortive case. The cerebro-spinal fluid was absolutely normal. But her brother, who was in the same house at the time, subsequently went down to the paralytic form of the disease.

These are the only two cases that I have seen in which the cerebro-spinal fluid has been even temporarily normal. The characteristics of the cerebro-spinal fluid in poliomyelitis are that the albumin-content is increased and that it contains cells in excess with normal sugar and normal chlorides and that it is sterile on culture. But whether the cells are lymphocytes or polymorphonuclears or mixed or in what numbers they exist does not seem to have any relation to the type of the disease or to its severity or to the prognosis. My pathologist reports "this fluid is indicative of a very severe infection," and the case turns out a mild one and completely recovers. Or he reports "a mild infection" and a fatal issue ensues forthwith. I think that when all the cells are found degenerate the result is usually very favourable.

## CLINICAL PICTURES.

Wickman, among his 1500 cases in the Swedish epidemic of 1905, described the clinical pictures of these patients under the following names: the carrier; the abortive case; the neuritic case; the spinal case; the spreading spinal case (ascending or descending or both); the meningeal case; the brain-stem case; the cerebellar case; the cerebral case; the mixed case.

This classification of Wickman's has been sneered at as neither a clinical nor a pathological classification and therefore unscientific, but it is nevertheless a most useful aid to memory and thought. One sees all these types and no one has as yet made a better classification. I will explain to you presently three other types which I think are worthy of emphasis, and will now say a few words about each of these types.

### *The Carrier.*

The carrier is not a hypothetical individual for he has been caught and caged after infecting others, and his virus obtained, cultured, and a chain of monkeys infected from this with typical clinical and pathological results. Sometimes this carrier himself succumbs to the disease as did Taylor and Amos's carrier. In this respect poliomyelitis is like meningococcal meningitis where 4 per cent. of the carriers succumb. But it seems probable that in poliomyelitis far fewer of the carriers are invaded. All the carriers seem to gain immunity. I think that the carrier is much more virulent as soon as he begins to carry and that his virulence thereafter wanes and dies out in a comparatively few days. Perhaps it is the carrier alone who infects, and certainly it is a chain of carriers who perpetuate the disease and carry it over from season to season and give rise now and then to the sporadic cases of the disease which occur in London, for example, every week of every year. His virulence is also dependent upon contact with high susceptibles and he is probably an important agent in "salting" the community.

Carriers are probably much more numerous than cases of poliomyelitis. Kling, Pettersen, and Wernstedt examined six families in each of which there was one case only and found 18 carriers among the non-affected members—a proportion of three to one.

It may be of interest to tell you a good story of a carrier.

A farmer in the West Country sold a horse to another farmer at a market town, and according to custom delivered the horse at the farm of the purchaser some 15 miles away a day or two later. He left home with his child ill with poliomyelitis. Having delivered the horse he took a meal with the purchaser and sat at table between two children. Within 48 hours both these children were ill with poliomyelitis and within 72 hours their mother and another child were infected. This farmer was surely the carrier who had infected his own child.

The question of a carrier is sometimes of prognostic importance, as in the following example :—

I was called in August last by Dr. H. Fraser of Harpenden, to see three children of one mother all very ill with poliomyelitis and still pyrexial. There had been no cases in Harpenden before these occurred, nor were there any afterwards. In reply to the mother's question of distress as to whether her other child in the house would take the disease, I said certainly not. Immune, when all the others went down, this child was very likely the carrier.

### *The Abortive Case.*

The case that I am about to describe to you is typical of nearly all those which I have seen in the present epidemic period. I am taking as abortive cases only those which show definite involvement of the nervous system. I have seen a great many abortive cases. I well remember having it myself at the age of 9 years and shall never forget the "machine gun" headache and stiff neck nor what my miserable limbs felt like after. I remember my sister having it in our nursery at home and the consternation of us children that for days she could not stand upon her legs. I remember my son having it and my physicians cheering me by diagnosing tuberculous meningitis.

A boy was removed from an infected school at Broadstairs by his parents and brought to London. I saw him the following day looking the picture of health and eating heartily. Twelve hours later the temperature rose and remained 99·5°–100·5° F. for 24 hours, the boy feeling as well as possible, eating heartily and with no catarrh, throat, or discomfort. Then his head began to ache violently, the worst headache he had ever had. I saw him within two hours of the commencement of the headache. The temperature was 104°. He was then very pink—almost pink enough to suggest scarlet fever, but pink all over and without any puncta. He lay with head retracted and neck stiff, and any attempt to flex the neck gave him severe pain in the spine down to the sacrum. Kernig's sign was well marked. He said he felt quite well but for the headache. There was very marked nystagmus. The pupils were unequal and the right one, which was the larger, reacted badly. When he held his hands up they showed conspicuous little jerky movements of fingers and joints which he could not control and which are very characteristic of the disease. The abdominal reflexes were absent, as were also the deep reflexes in the arms. His breath smelt peculiarly nasty. I drained off all the cerebro-spinal fluid I could get—some 2 ounces. It was typical of the disease. The drainage instantly relieved his headache which did not return. It also relieved his head retraction. He was quite convalescent three days later with the disappearance of all his physical signs, but for a few days he said that he could get no push into his muscles.

Nearly all the abortive cases that I have seen have been just like this one with pyrexia, headache, signs of meningeal irritation, nystagmus, jerks of the limbs, and some loss of reflex action superficial or deep, and occasionally some loss of power. Other signs met with have been catarrh of nose and throat, vomiting, diplopia, and convulsion. I have not met with the profuse sweating nor the severe diarrhœa which have been prominent in other epidemics. Doubtless there are much milder types of the abortive form than that I have just described to you, and in the severe epidemics Wickman and other workers have proved cases of mild fever without any nervous signs at all to be cases of poliomyelitis. If such cases occurred at Broadstairs they were very rare. Perhaps I saw one at Broadstairs but I did no lumbar puncture and disregarded it.

### *The Spinal Case.*

The spinal type of the disease in its usual form is so well known to you as to make description superfluous. I need hardly emphasise the frequently occurring cases where the thoracic spinal cord is solely or chiefly implicated, giving rise in the end to spinal curvature. This disease is by far the commonest cause of scoliosis and kyphosis and is often overlooked as a cause for these conditions. But there are several peculiar varieties of the spinal type which deserve special mention. Here is one of them.

More than 30 years ago a man aged 22 years was admitted into the National Hospital under Dr. Thomas Buzzard, pyrexial and completely paralysed in all four limbs and in

the lower trunk. There was no affection of sensibility nor of sphincters. The diagnosis of poliomyelitis was obvious. I found that all his reflexes, both superficial and deep, were present, and I was greatly surprised and communicated my surprise to Dr. Buzzard who at once said, "You will find that this patient will make a complete and dramatic recovery." This patient did make a rapid and complete recovery.

This autumn Dr. F. H. Watson sent me to St. George's Hospital a child from Sheerness paralysed in all four limbs with poliomyelitis, saying that he was tired of hopeless cases of this disease, and would I relieve him for a time of this one. I found, notwithstanding the paralysis of five days' duration, that all the reflex action, both superficial and deep, was present. I said to my students, "this child will recover rapidly and completely," and notwithstanding great disbelief on their part, we returned this child to Dr. Watson in four weeks perfectly well, having brought about this miracle by doing nothing except a lumbar puncture to confirm the diagnosis.

Such cases as this with retention of all reflex action always do recover perfectly and rapidly. It is important that you should know this, though it will worry you in your accepted notion of the pathology of the disease. But you must not think that from what I have said recovery does not occur when the reflexes are lost. It often does sometimes completely, sometimes partially.

Another unusual spinal type which may puzzle you is that of acute transverse myelitis. I can make this plain to you in a very few words. Imagine a severe local dose of poliomyelitis virus delivered from the intestines along the ninth dorsal nerves into the small dense ninth dorsal segment, where there is little grey substance to matter. The result is intense inflammation with swelling of the segment so great as to compress all the tracts and abrogate all function below the level of the lesion with paralysis of motion, sensation, and sphincters, below the umbilicus. But the paralysis is not for long a flaccid one. It soon becomes spastic with extensor responses and increased reflexes. It usually makes good recovery when the swelling abates. Rarely it leaves complete transverse destruction of the spinal cord. Here is a good example. I was called by Dr. T. Gardner in October last to see a lady at Brighton. She had been to a dance on a Saturday, where she met her carrier. On Monday she was seized with the most severe headache of her life. On Wednesday morning she woke having lost all power and feeling in the legs and with complete retention of urine. She had the common meningeal signs of the disease, with those of a transverse lesion of the cord. The cerebro-spinal fluid was typical. She was obviously regaining sensibility when I saw her a few hours later, and therefore I made a very cheerful prognosis which has been justified.

### *The Neuritic Case.*

The neuritic type of poliomyelitis is nothing more than some variety of the spinal type in which there is great pain and tenderness in the paralysed region. Sometimes the pain and tenderness is so great as to increase the apparent paralysis to completeness. It is a most fascinating variety of the disease from the pathological view. It does not seem to make a very bad prognosis, nor to occur with the completely paralysing varieties of the disease. The muscles are as tender to pressure as those of an alcoholic neuritis, hence the name "neuritic type," any attempt at stretching the affected muscles by passive movement produces agony. Some of us think the joints are also inflamed. Contracture of an early kind is likely to follow this type and the more so because you cannot splint or stretch because of the pain. This neuritic type is sometimes troublesome in diagnosis. I have many times been called to cases of acute rheumatism as cases of poliomyelitis because of the apparent paralysis that the pain may cause and vice versa, but you will remember that pain always increases the reflexes both superficial and deep, whereas poliomyelitis generally abolishes them. The following case of difficulty may interest you in this connexion.

I was called recently by Dr. De Vere Hodge, the M.O.H. at Woodford, to see a case notified as poliomyelitis in an institution containing several hundred boys. A boy three weeks convalescent from poliomyelitis had recently been admitted and had slept for some days in the same room as the patient. The patient had been taken ill a few days before with severe diarrhœa with copious watery evacuation lasting 12 hours. There had been no pyrexia and no headache. Next morning he had bad cramp in the legs followed by continuous severe pain in all four limbs with extreme tenderness and pain on stretching. His arms had recovered when I saw him, but his legs he could not move. All the reflexes were increased, and the agony I gave him in obtaining these brisk reflexes was obvious reason why he could not move this legs.

Now here was a difficult case for the doctor in charge. A contact with an undoubted case of poliomyelitis. Apyrexial cases of poliomyelitis certainly do occur. Diarrhœa at the onset is in all the books as a well-known occurrence in the disease. The tenderness, pain, and agony on passive movement were exactly like what one sees in poliomyelitis. No wonder the medical officer notified the case. However, directly I had examined this case, and before the cerebro-spinal fluid had been examined, I turned this case down as certainly not a case of poliomyelitis, on these grounds. I am an utter agnostic of case-to-case infection in this disease, and even for a believer if such a person exists the period was much too long. Apyrexial poliomyelitis bids you be very sure before you make a diagnosis. Severe gastro-intestinal upset may cause acute tetany and a host of other queer muscular troubles. I have never seen cramp in poliomyelitis, nor the reflexes universally brisk. The cerebro-spinal fluid proved normal in this case.

There is one suggestion I wish to make with regard to children who are brought to you with the complaint that they have gone weak on the legs and fall unduly and are unwilling to walk. You find a healthy child with no physical signs and cannot explain the condition. Such children always recover in a little time. I have seen this condition succeed definite abortive poliomyelitis so many times as allow me to suggest that this is a reasonable cause in all the cases. I have one of the Broadstairs boys under my care at present who was an abortive case, and for a long time went lame on one leg when he got tired. Yet never could I find the least trace of weakness in any muscle.

### *The Spreading Spinal Case.*

The spreading cases are of the Landry type, ascending or descending, or both. Usually in poliomyelitis when you are called to a case after the spinal paralysis has developed, you are able to say with certainty that the worst is over and that nothing but improvement will subsequently follow. But before you do this make quite certain that the paralysis is stationary. Ask the patient how the weakness compares with what it was two or four hours ago, or wait some hours with the patient and see for yourself. Otherwise an innocent-looking lower limb paralysis may creep up and involve trunk, arms, and respiration and prove fatal. I have never seen it spread when once it has remained the same for hours. It spreads rapidly, sometimes the increase is obvious from minute to minute. I remember spending the night with Dr. F. S. Lloyd, of Luton, watching the paralysis spread from the legs to the trunk and then to the intercostals and arms. Then the diaphragm failed and for nearly an hour he breathed with his neck muscles. Then we noticed the diaphragm come in again and then the intercostals, and before we left him we were safe as regards death. This patient made a complete recovery. The spreading cases seem to be peculiar to some seasons. I have not seen a single case during 1926. In the autumn of 1924 nearly every case I saw was of this type and almost all of them were fatal.

### *The Meningitic Case.*

You will say at once that I have already described the meningitic form of the disease in dealing with the usual abortive case in which the signs are so largely those of meningitis. So I have, and this is what I take it most of the epidemic observers have

called the meningitic type. But the following case will tell you of something much more startling and something which was entirely new to me.

It was a case of Dr. M. O. Raven's at Broadstairs—a boy who had come home from school five days before with a bad headache and a temperature. He soon developed diplopia and head retraction. When I saw him his temperature was low. He was deeply unconscious with the eyes open and with complete incontinence. He was very thin, white, with retracted abdomen, and stiff extended legs with increased jerks everywhere and extensor responses. A typical picture of a dying tuberculous meningitis. I said to Dr. Raven that I was sure it was tuberculous meningitis. I said to the boy's mother: "I do not think that your boy has the disease which is about the town; I fear that it is another much more fatal disease, and if it is, I can give you no hope, but if it is the disease that is about the town I think he will get better." So sure was I that he would die of tuberculous meningitis that I made the alternative prognosis rosy to comfort the woman. I took the C.S.F. back with me with the following result: chlorides normal, therefore it was not tuberculous meningitis; sugar normal, therefore it was not any form of bacterial meningitis; culture sterile and fluid characteristic of poliomyelitis. This lad made a rapid and nearly complete recovery, and a fortnight later was well but for a slight weakness of one deltoid.

In this case I had unexpected and entirely undeserved luck in prognosis.

*The Brain-stem Case.*

This type of case I leave undescribed because I have never seen one, and because I am unconvinced by any descriptions of such a condition which have been made. I know that lethargic encephalitis loves the brain-stem and basal ganglia, and it is obvious that the cases of brain-stem poliomyelitis which Batten published in the Lumleian lectures of 1916 were examples of lethargic encephalitis which was, at that time, an undescribed disease. You surely would not have me describe the nystagmus, diplopia, pupil changes and peripheral facial paralysis of poliomyelitis as a "brain-stem" type, since they are met with as transient symptoms in any type of the disease and are important in diagnosis only. They are, of course, indicative of a mild involvement of the brain-stem. Such symptoms do not seem to be on the same footing as the limb paralysis; they always get better. Moreover, the facial paralysis sometimes involves loss of taste and therefore cannot be due to a nuclear lesion. It is interesting to read that ordinary Bell's paralysis is much more prevalent when an epidemic of poliomyelitis is incident, but on this subject I have no knowledge.

*The Cerebellar Case.*

This is strikingly unlike the other forms of the disease. It is a matter of an acute onset of cerebellar ataxy following headache and pyrexia. The following case was a beautiful example:—

A public school-boy on returning from a walk fell out 200 yards from home saying that he could not get home because his head was so bad. He was carried in and placed in a chair where he collapsed, not mentally but physically. This was the flaccidity of acute cerebellar disease. A diagnosis of a "touch of the sun" being made, he was carried to bed where he went to sleep. Next morning no one could understand his speech; it was so wildly ataxic. He could not sit up or guide his limbs, and he was sick when his head was moved. He had only a slight temperature. I found him with the most extensive nystagmus, speech ataxy and bilateral ataxy. The C.S.F. was typical of poliomyelitis. I brought him back with me to London, and observed day by day an ever quickening disappearance of all his symptoms. He was quite convalescent in six weeks.

This will impress you with the very great recuperative powers of the cerebellum if the lesions are not too severe.

*The Cerebral Case.*

In this type severe and repeated convulsion usually follows upon pyrexia and headache, sometimes fatal in a very few hours as in the first fatal case at Broadstairs, sometimes lasting many hours or days, and merging into lengthy subcoma from which the patient gradually rouses to show some cerebral defect, mental, diplegic, hemiplegic, or hemianopic, or perhaps to recover completely. It is usually held to be the common case of hemiplegia in a child following convulsions. Sometimes the hemiplegia or other sign of cerebral involvement comes on very quietly even in the conscious state, as in a case which I saw with Dr. W. Pitt-Payne of Bromley, who called me to see a boy with an obvious meningitis but who seemed so well and so little distressed by his illness that doubt had arisen as to what was the matter. When I arrived I pointed out to Dr. Pitt-Payne that the boy had a complete left hemiplegia. The doctor was astonished for he had examined the boy some two hours previously and found no hemiplegia. But there it was, a severe hemiplegia too. It had come on in a perfectly conscious boy who was not feeling ill. The cerebro-spinal fluid was typical and this case made a complete recovery.

*The Relapsing Case.*

I must now refer, for a moment, to cases in which the patient seems to become apyrexial and convalescent, and after a few days redevelops symptoms sometimes of alarming severity. It is a matter of a second blaze of infection which has remained alive within the tissues. I think that you may perhaps anticipate the occurrence of a relapse by an unusually flat-topped temperature chart in the first few days, and by the fact that the so-called apyrexial interval contains little sudden jumps of temperature which suggest continued infection, instead of the usual rapid blaze, high peak, and rapid fall of temperature. Now whatever the books may tell you about dreadful results in a relapse, I have never seen any harm occur, no occurrence of paralysis, and no increase of paralysis. Indeed, in a case which I saw with Dr. Pollock a short time ago with an eighth day relapse with very high fever and great restlessness and headache, it was obvious that the paralysed legs were improving continuously in spite of the relapse.

*The Mixed Case.*

It is amazing how rarely one sees a case of poliomyelitis in which the types are mixed, and this is why for so many years the spinal, meningeal, cerebellar, and cerebral forms were described as separate diseases. But the epidemics in which the several types are seen much more often, and the pathologists have settled that all these clinical pictures result from one and the same infection. I suppose the explanation may be the curious local advent of the virus to the nervous system from the mucous membranes by way of the nerves only, as in rabies and tetanus, and the rapidly acquired immunity which may keep the disease local. But one does see mixed cases. Some years ago a little girl was admitted into St. George's Hospital, under my colleague Dr. J. A. Torrens, with right hemiplegia, atrophic paralysis of the left leg, and peripheral facial palsy of the left face. Here were the spinal, cerebral, and brain-stem types altogether.

As my last clinical example let me describe to you a case that might be justly called one of general poliomyelitis.

A man belonging to London, aged 26 years, was admitted under my care at St. George's a few weeks ago with the story that on the Tuesday of a certain week he developed a bad cold and felt ill. On the Thursday he felt better and returned to work, but developed diplopia for which he sought his doctor on Sunday morning. The doctor, finding him pyrexial and with diplopia, sent him to hospital where he gave a detailed and accurate account of his illness; during Sunday night he lapsed into unconsciousness, and on Monday I could find nothing alive at all in his nervous system except miserable attempts at respiration. Consciousness, pupil reactions, swallowing, coughing, reflexes, sphincters—everything gone. The whole nervous system killed out quietly in 24 hours. He had a large patch of pneumonia by this time. The cerebro-spinal fluid showed a high polymorph count, so we thought of acute pneumococcal meningitis as a well-known rapid destroyer. But the cultures were sterile. Lethargic encephalitis was mentioned, but was impossible for no polymorph has ever been found in the cerebro-spinal fluid in that disease. Moreover, I have never seen lethargic encephalitis knock the spinal cord out as a whole. My pathologist at the autopsy found the whole nervous system bright scarlet in colour, and said at once lethargic encephalitis. I

said "no," this is poliomyelitis. The sections subsequently showed an acute inflammation of the whole central nervous system, and in the perivascular lymphocytic exudation of that inflammation were the multitudinous polymorph cells which are characteristic of poliomyelitis and which alone distinguish it from the inflammation of lethargic encephalitis and the inflammation of syphilis.

This was the most severe case of poliomyelitis that I have ever seen or heard of.

*The Apyrexial Case.*

One word with regard to cases which show no pyrexia or headache and are therefore difficult for the doctor, for I have one at the present time, paralysed in the legs, which occurred at Broadstairs last July though it was not notified, and which seemed to me to show that the Broadstairs epidemic did not come from Brittany as many supposed when it appeared in October, but that it came from Broadstairs. The apyrexial cases without headache are rare in my experience. I believe that they only occur in sporadic cases, and mean infection in a partially protected subject. They do not occur in the epidemics. They are always of the pure spinal type like most of the sporadic cases. They seem to be much less common of recent years, for Allen Starr, writing of a large number of cases years ago, says that 30 per cent. of them were apyrexial, whereas I have certainly not seen half a dozen apyrexial cases in my life. One has to remember that poliomyelitis is certainly increasing in virulence. Allen Starr did most of his work before epidemics of the disease were common, and I have had experience of a considerable epidemic period.

*Rashes.*

A great many rashes have been described in poliomyelitis, none of them very usual. I am not here referring to the pink skin upon which I have laid some stress as a rash. But there are two rashes which are worthy of mention. One of these is herpes zoster, which has been reported many times. It is what one would expect, for I cannot believe that the inflammatory lesion of poliomyelitis never invades the roots and the root ganglia. I think that there is strong clinical evidence that it does in some cases, as, for example, those with peripheral facial palsy with loss of taste. But I personally have never seen it nor have I seen the scars of zoster on any old case of infantile paralysis that I can remember. The other is a striking rash of most peculiar appearance and distribution consisting of large bluish-purple papules, not collected in bunches and distributed over the paralysed region only. I have seen this rash quite half a dozen times. The first time I saw it was years ago in a nurse at the Hither Green Fever Hospital, who was pyrexial with a severe paralysis of the right arm and shoulder, which upper limb and shoulder were smothered with the papules I have described. The last time I saw it was the other day at Harrow with Dr. S. H. A. Lambert and Dr. C. F. Mayne in a fatal case of paralysis commencing in and chiefly affecting the whole trunk. The whole back and sides were covered with a similar rash which had been attributed to the use of a liniment for pain. You may say this was herpes zoster, and perhaps it was a rash of the same pathogeny. Yet though I know and have seen that herpes zoster may look like anything from an erythema or a purpura, or a papular rash to the fully developed lesion, yet it has always had a characteristic corymb-like distribution in patches, and that has not been the case with the eruption which I have just described.

SOME DEDUCTIONS.

I hope I have not wearied you with much clinical detail but it is important, and upon it has been based most of our knowledge of the disease and all the inspiration which Wickman brought to his pathologists and which led to the sound bacteriological and pathological understanding which we have of poliomyelitis. One word of comfort to you as medical officers in charge of schools. This disease does not like schools, institutions, and large towns. It has been said that it will not spread in institutions. In one of the bad epidemics in America during a raging season, 45 schools of the infected locality containing 3600 children of the most susceptible age were kept under observation and only one case occurred. At the Hospital for Sick Children, where pyrexial cases of poliomyelitis are often received, no case has been recorded of spread of the infection to another child. Dr. Batten, who had a 30 years' experience of Great Ormond-street Hospital, went into that point with his characteristic thoroughness and vouches for the fact. Let any one of you who holds to case-to-case infection in this disease explain such a fact. Take what happened at Broadstairs in the schools, all the many cases occurring in the blaze of a few days and then no more cases. There was no case-to-case infection. Look at the results in the Broadstairs preparatory schools as compared with what was happening in the town. True we had two fatal cases before the malady was discovered, and one in a lad who was immediately removed by his parents to the depths of the country. Otherwise one trivial case of slight paralysis was the only bad result. There were plenty of cases of bad paralysis in the town. This was because poliomyelitis does not like schools and will not be virulent in schools.

May I commend to your notice who are especially interested in community infection, epidemics and disease to the fascinating work of W. W. C. Topley and M. Greenwood upon community disease in rats[2] and the exhilarating work of Surgeon-Commander S. F. Dudley on invasion,[3] carriage, and salting which has just been published by the Medical Research Council, both of which will help you much in the understanding of epidemic disease.

The work of Topley and Greenwood has been carried out with infectious diseases in communities of rats. They draw these conclusions:—

(1) If you keep a herd of infected rats strictly isolated you will in time, perhaps in a short time, get rid of the infection.

(2) But if you allow a few unsalted immigrants to dribble into the infected herd from time to time you will never get rid of the infection.

(3) The effect of every addition of susceptibles is to raise the virulence of the infection, and in time the hitherto immune members of the herd succumb and at last even those who have recovered from the original infection succumb to the ever-increasing power of the infection.

(4) It is a much safer thing for the herd to introduce a thousand susceptibles in one day than to introduce ten a day for a hundred days, for the obvious reason of the ever-rising virulence which repeated ingress causes.

From these conclusions it would follow that we should keep our infected communities together and allow no ingress if we wish to break a community epidemic.

Surgeon-Commander Dudley's work has been done upon humans in schools and depôts, and he has reached the same conclusions. He says: If any one of us is exposed to an infection emanating from the respiratory passages—he calls it "droplet" infection—one of three things must happen: (1) we become invaded and develop the disease, or (2) we become carriers of the disease, or (3) we become "salted" or immune to the disease. Which result will happen will depend, Dudley argues, upon three variable factors: first, the amount of infective material received by the host per unit of time; second, the rate at which the infective material can be destroyed by the host; third, the rate at which the microbic proteins stimulate or depress the immunity mechanism of the host. These factors being equal the result will depend upon the distance of a susceptible host from a distributor of infection as to whether the former becomes a case, a carrier, or immune.

There is another important factor in the wax and wane of a community infection, and that is bacterial

[1] Milroy Lectures, 1926, THE LANCET, 1926, i., 477, 531.
[2] THE LANCET, Jan. 15th, 1927, p. 139.

variation in response to changes in the herd immunity, and this will explain the dying out of a community infection despite increasing numbers of carriers and despite the continual introduction of fresh susceptibles as happened at the Greenwich Naval School with a diphtheria outbreak. Dudley thinks that carriers acting in a suitable environment may prevent great disease outbreaks by supplying subinfective doses to the more susceptible members of a population, and in this way the general resistance to epidemic disease is increased and the herd is vaccinated by its carriers. This work has possibly a most important bearing upon poliomyelitis, for we know well that an epidemic of this disease in a community clears out all the susceptibles and leaves the community immune. When another epidemic affects that community only those born after the previous epidemic are affected. It seems to me that Dudley has suggested a likely explanation of the means by which this immunity is attained.

# An Address
ON
# POLIOMYELITIS.

*Opening a Discussion held at the Medical Society of London on Feb. 7th*

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ALL those of us who have had to deal with cases of acute poliomyelitis will have learned to regard seriously a disease which lays upon us such heavy responsibilities. Not only have we difficulties of early diagnosis to contend with, and questions of treatment in which each case presents its own special problems, but there arise urgent questions of public health in the dealing with which there are no generalisations upon which we may safely rely. There is certainly no acute specific fever in which the patient is so profoundly dependent for the degree of his restoration to activity upon the unremitting and skilled attention of his physician for months or even years after the short-lived infection has burnt itself out.

In my brief contribution to the discussion which it is my privilege to open, it is manifestly impossible to deal with every aspect of the malady, and I need not apologise therefore for inevitable gaps in my remarks. I shall content myself with an attempt to give a clinical conception of poliomyelitis as a whole, to indicate the lines of treatment of its various phases, and to summarise what is best established in respect of its epidemiology.

## THE CLINICAL PICTURE.

In acute poliomyelitis we have an acute specific fever, a systemic infection, which may or may not proceed to invasion of the nervous system by the virus responsible. It occurs sporadically and epidemically. The complete clinical expression of the disease consists in a short-lived initial phase of constitutional disturbance followed by signs of invasion of the subarachnoid space and by those of involvement of the nervous tissue itself. It is in the last that the specific lesion of the disease is produced. But as long as 20 years ago the conclusion was reached by the Swedish observers of the disease in its epidemic form that an appreciable proportion of patients recover from the infection without developing paralysis, a conclusion which more recent investigations in America has amply confirmed, and G. Draper may be taken to express the general view when he states that these so-called "abortive" cases may number from 50 per cent. upwards of the total case incidence in any given epidemic. We are in a position to say that these conveniently, if somewhat loosely termed, "abortive cases" depend for their occurrence upon the dying-out of the infection, either on the completion of the phase of general infection, or even after invasion of the subarachnoid space, but before the virus has gained access to the neuraxis itself.

It is customary to speak of poliomyelitis as presenting two clinical phases, one of general and a subsequent one of nervous system involvement. I submit, however, that a more precise as well as a more practical conception of the malady is obtained by recognising the existence of three clinically and pathologically distinct stages in its evolution: one of general infection, one of invasion of the subarachnoid space, and a third of invasion of the central nervous system itself. It is only when the last occurs that paralysis ensues. Each clinical phase has its corresponding pathological substratum. During the general phase the virus obtains lodgment in the liver, spleen, lymphatic glands (and in the experimentally produced disease at least) in the bone-marrow, in all of which tissues lesions are found. Secondly, the virus reaches the subarachnoid space by a channel to which we have to refer later, giving rise here to a characteristic meningeal reaction as revealed by examination of the cerebro-spinal fluid. Finally, it may obtain lodgment in the grey matter of the central nervous system producing there the familiar inflammatory lesions.

The study of the disease, therefore, in its epidemic form has served usefully to turn our attention from a too exclusive consideration of the ensuing paralyses to its preparalytic stages. It is clear that if we could with certainty recognise and effectively scotch the infection at this period, we should deprive it of its terrors, since death when it occurs, like disablement, is the result not of general toxæmia but of nervous system involvement.

### *The Phase of General Infection.*

Turning now to a brief consideration of the first of the preparalytic phases, that of general infection, we may say that it is very short-lived, lasting for from a few hours to three or four days. The constitutional reaction may be so slight as to escape notice or may be of considerable briskness. It does not as a rule present features by which we can identify it with certainty, although during the course of an epidemic the reaction may be of so uniform a quality as to allow the alert observer to suspect the character of the infection with which he is dealing. Fever is the most constant component of the clinical picture, the temperature rising to 101° or 102° F. The child suffers from malaise, and behaves in the manner customary with the febrile child. Such local symptoms as develop appear to vary from epidemic to epidemic, and tend to conform to one of three main types: a gastro-intestinal with vomiting and less frequently diarrhœa, a tonsillar with signs of faucial inflammation or a coryzal with symptoms of upper respiratory manifestation. Whatever form the symptom-complex may take we may regard it as indicating the fully established general infection and not merely a prodromal stage. Occurring in an uncomplicated form, this stage is free from symptoms of meningeal invasion, and the cerebro-spinal fluid is normal in character.

### *The Stage of Subarachnoid or Meningeal Invasion.*

The onset of the stage of subarachnoid or meningeal invasion stands in a somewhat variable time relationship to that of general infection. In certain severe cases the two phases may develop synchronously, or they may overlap, signs of meningeal invasion developing before those of general infection have abated, or finally, there may be a pause of from a few hours to a day or so between them. When such a pause occurs, and while it endures, the child is generally assumed to have recovered from some trivial febrile disorder.

Like the constitutional reaction, the meningeal reaction varies in intensity, being at times unnoticed

at others of great violence. It is of even shorter duration, ending in recovery, or passing into the final phase of nervous tissue involvement within a few hours. The clinical components are fever, headache, pains in the back and limbs, rigidity of the spine with resistance to passive flexion, the so-called "spine sign" of American observers, muscular twitchings, and a peculiar starting jerky tremor when the patient is handled or makes voluntary movements. In severe reactions there may be head retraction, opisthotonos, and the combination of drowiness with irritability, or even deep stupor. It is obvious that one or more of these components may be lacking in the individual case, but headache, the spine sign, and pain in the back and limbs we may regard as constant. During this phase examination of the cerebro-spinal fluid reveals the presence of a meningeal reaction. On lumbar puncture, the fluid escapes under pressure, and is clear except when great excess of cells renders it opalescent. The cell content is constantly increased, the count ranging from 30 or 40 to 2000 cells per c.mm. Early and very transiently polymorphonuclear cells predominate, giving place within a few hours to a lymphocytosis. As this change occurs the globulin content of the fluid tends to rise, the glucose and chloride readings remaining normal. Examination of the blood at this stage reveals a leucocytosis in most instances, the total white cell count rising as high as 25,000. There is a relative predominance of polymorphonuclear cells.

Even although such a meningeal reaction occurs, indicating as it does the invasion by the virus of the subarachnoid space, recovery may yet ensue without the development of paralytic phenomena; such cases constitute the so-called meningitic form of the disease.

*The Appearance of Paralytic Phenomena.*

However, once the virus establishes itself within the nervous system, paralytic phenomena which vary with the localisation and intensity of the lesions make their appearance. The most acceptable classification of the clinical pictures resulting is one that comprehends cerebral, cerebellar, brainstem, spinal and a less certain neuritic form. Of these the spinal form is by far the commonest. In this paralyses of varying intensity and extent make their appearance with a suddenness which is all the more dramatic when the two preceding stages have been unnoticed or unrecognised. The generalisation that paralysis is always sudden in onset and maximal at this moment has its exceptions, and in some cases the paralysis may ascend until it ends in respiratory paralysis, or may proceed from limb to limb in a series of jumps.

Of the paralyses themselves it is scarcely necessary to speak here, but certain aspects of the clinical picture may be mentioned. Of the total number of muscles initially affected the majority are but partially paralysed, and there occur cases in which a large number of muscles are but slightly impaired in voluntary power and none is profoundly paralysed. Such patients present an appearance of generalised slight weakness which may be mistaken for a post-febrile or a post-influenzal debility, so that the nature of the malady may be entirely overlooked from beginning to end. Such generalised weakness may be transient, lasting for a period of days only, but when it occurs a systematic examination of the tendon jerks and of movements at all joints will generally reveal the existence of a local incidence of the disturbance, and thus betray its nature. In another group of cases, where both legs are profoundly or completely paralysed at onset, a period of two or three days' retention of urine is not uncommon. Again, in other cases with severe and extensive cord lesions, the white matter of the antero-lateral columns may be involved with the appearance of unilateral or bilateral Babinski plantar responses.

Pain is another frequent accompaniment of paralysis in the affected muscles. It may vary from slight pain on movement and manipulation of but a few days' duration to intense and widespread pain, lasting for several weeks. It is possible that pain has a certain prognostic value in respect of the muscles in which it occurs. Careful examination will generally reveal that not all muscles are tender to pressure or painful on movement, and it has been my impression that in the early days of the illness, of a number of profoundly or totally paralysed muscles, those which are painful to pressure or manipulation are those which earliest show signs of recovery and regain power most rapidly, while those which are totally paralysed and painless are those which the subsequent course of the case will show to be permanently paralysed. During the first two or three weeks prognosis as to recovery of power is always difficult, and should experience prove this impression to be accurate, pain and tenderness may be a sign of definite prognostic value.

From what has been said of the preparalytic stages of poliomyelitis, it is clear that diagnosis at this period depends upon the recognition of the signs of subarachnoid invasion which I have enumerated. It must be confessed, however, that unless in the presence of an epidemic, or of well-developed general and meningeal reactions with the characteristic intermission between them, diagnosis before the appearance of paralysis is likely to remain exceptional.

TREATMENT.

When we come to consider questions of treatment it is clear that the pre- and post-paralytic stages of the malady present two distinct problems During the former and the early days of the latter stages the infective character of poliomyelitis calls for appropriate measures, but an even more urgent problem arises during the preparalytic period, that of arrest of the infection before invasion of the central nervous tissue.

*The Preparalytic Stage.*

Assuming that a diagnosis has been made with reasonable certainty at the onset of subarachnoid invasion, there remains at most but a period of hours in which to arrest the progress of the infection. In respect of the use of drugs for this purpose there is only one substance, hexamine, of which trial has been made, and this, on the basis of some experiments of Flexner and Amoss. They found that on oral administration this substance can be detected in the cerebro-spinal fluid, and that the development of the experimentally produced disease in monkeys could be delayed, and in some instances prevented by keeping the animals under the influence of the drug both before and after inoculation. In the past, however, the use of hexamine in the customary dosage for infections of the nervous system has not given very promising results. Possibly the employment of massive doses with alkali, as has been suggested recently, might be more fruitful.

It has been found that the serum of convalescent or recent cases of poliomyelitis contains immune bodies, and the administration of such serum, both intrathecally, intravenously and subcutaneously, has been tried during recent epidemics. The method has given promising results in cases treated during the preparalytic stages in the form of a combined intrathecal and subcutaneous or intravenous administration. Since the serum of human convalescents is alone available for this purpose, it is obvious that, however encouraging we find these results, we have not yet available a method of serum treatment, either in itself reliable or equal to the demands which an epidemic of any severity would speedily make.

Whether or not lumbar puncture and thecal drainage during the meningeal stage has any therapeutic value is uncertain. It has been said that in patients with a brisk meningeal reaction the symptoms may be relieved by this means.

In respect of the *infectivity* of poliomyelitis, it is clear that the patient should be isolated and his secretions treated as infective, since the nasopharynx is known to harbour the virus. Precautions to this end may, in all probability, be safely given up three weeks after the temperature has fallen, as the presence of the virus after this period has not been recorded in the human subject.

Whether the routine use of antiseptic gargles has any other value than to impress upon the patient and his attendants the infective nature of his malady is problematical, but even this, though a modest, may be a useful function.

*The Postparalytic Stage.*

The period of infectivity once passed, the treatment of the paralysed muscles alone remains. It is not now possible to do more than formulate some general principles in respect of this. During the remainder of the acute stage—that is, until the disappearance of pain and tenderness—no other therapeutic measures are permissible than rest and the prevention of deformities. Local treatment, either as massage or electricity, are strongly contra-indicated, not merely as useless, but as calculated to aggravate the pain and to prolong its duration. There is no need for me to stress the difficulties which this policy of apparent inactivity may present, in the face of the fantastic claims made for electrical procedures, and the faith which the public has in this and other mysterious forces. Whatever we believe of the value of this form of treatment in the convalescent stage, it is most certainly unjustifiable during the acute stage. Upon this point all experienced observers are now agreed.

The prevention of deformities is achieved by placing the paralysed muscles as completely as possible in a position of physiological rest. When, as so frequently happens, we are dealing with paralysis of adjacent and antagonistic groups of muscles this position must necessarily be one intermediate between full lengthening and shortening of the muscle, and as near the minimal length as possible.

Various methods of *splinting* have been advocated to fix the limb in the desired attitude. It is clear that the age and condition of the child and the degree of pain present will determine which method best suits the individual case. We may, however, enter a warning against the total immobilisation of a limb for any length of time within a plaster splint, a method by which paralysed and intact muscles are alike completely fixed, to the great detriment of the latter.

*Re-education.*—With the arrival of the pain-free convalescent stage the maintenance of good posture, which remains essential, may be supplemented by more active procedures. Placed in order of value, those adopted are active re-education exercises, massage, and electrical stimulation. We may briefly dispose of the two last named. There is an increasing consensus of opinion amongst experienced observers that at best electrical treatment in any form is of doubtful value and at worst is definitely harmful. Harmful in that it is apt to replace valuable methods of treatment and to aggravate the imbalance between opposing muscles of variable degrees of weakness, and at best of doubtful value in that carefully observed cases which have been thoroughly dealt with by other means do as well without it as with it. Lovett, of Boston, who carried out control observations on this point, failed to find evidence of benefit from electrical treatment.

*Massage* undoubtedly has a most useful though restricted sphere of usefulness. When carefully administered it maintains the inactive muscle in as good a condition as possible pending its renewed innervation. It helps to preserve a useful effector organ for the restored neurone to innervate. It has no other influence. It is most valuable in the case of completely or profoundly paralysed muscles for which active exercise is out of the question.

Unquestionably of primary importance, though far more difficult to obtain, is the re-education of the affected muscle by active exercise. For every patient a scheme of such exercises must be drawn up according to the particular muscles concerned and corresponding to the degree of their weakness. This must be revised from time to time as recovery proceeds. Details of such exercises are to be found in Lovett's "Treatment of Infantile Paralysis." This active re-education involves the mobilising of the patient at the earliest possible moment. Here we seem to run counter to a widely cited dictum that even momentary and slight stretching of a paralysed muscle permanently impairs its chances of recovery. It seems to me that this sweeping statement is unsound on physiological grounds, and in practice condemns the patient to an indefinitely prolonged immobilisation which must react unfavourably upon the whole neuro-muscular system.

We now know from the researches of Sherrington and Liddell that stretching of the muscle-fibre is the normal physiological stimulus for the production and maintenance of muscle tone and other proprioceptive reflexes, and it seems incredible therefore that, within reasonable limits, a physiological stimulus can be essentially harmful.

INCIDENCE, SUSCEPTIBILITY, AND MODE OF SPREAD.

Like every other acute specific fever, poliomyelitis has its particular seasonal and age incidence, susceptibility factor, incubation period, and mode of spread.

In its epidemic form it is a disease of late summer and autumn, August being usually the month of maximal case incidence. But outbreaks occur at varying times from this into the winter. It is characteristically a malady of early childhood, of the second to the fifth years of life. After this period the case incidence falls rapidly, although it occurs throughout childhood and adolescence and, less commonly, in adult life. The various estimates of the incubation period range from 2 to 12 days; from 3 to 4 days is probably the most common. All available evidence indicates, to use the words of the Rockefeller monograph, that epidemic poliomyelitis is "a human-borne contagious affection, the portal of entry for the virus of which is the upper respiratory tract, in particular, the nasopharyngeal mucous membrane."

The infection is carried and spread by sufferers from the disease, both in its complete and its so-called "abortive forms," and also by healthy carriers. In these the virus is present in the nasopharyngeal mucosa and in the secretion thereof. It is probable that from this situation it gains access to the subarachnoid space through the perineural lymphatics of the olfactory nerve filaments, and having once gained such access may again pass out by the same channel into the nasopharynx.

In the case of the infected patient, the observations of Flexner and Amoss indicate that the virus generally disappears from the nasopharynx of convalescents within three weeks of the onset of the disease. There is no evidence of the existence of chronic active carriers. The longest known period of carriage by a healthy subject is that recorded by Amoss and Chesney, who detected the virus in the nasopharyngeal secretions of a healthy girl five days before she developed the disease. Hence the presence of chronic carriers of either type is unproven. The following case is of interest in relation to this question:—

H. J., a boy of 11, spent the month of August in Brittany, a known infected area. He returned to his boarding-school in September and remained healthy until Nov. 3rd, when with six other boys he went sick with sore-throat. In all of them there was pyrexia of from 100° to 101° F. and a typical condition of follicular tonsillitis. On Nov. 6th all the seven were released from the infirmary and went to morning chapel. While dressing the boy in question noticed that his right leg was weak and ached somewhat. On the way to chapel he was seen by the headmaster to fall down and to be unable to get up again. That evening examination revealed definite weakness of moderate degree of several muscles in the right lower limb, with loss of the knee-jerk. The other six boys remained well.

There are two possible interpretations of this episode. That all seven boys suffered simultaneously from poliomyelitis, all but one proving abortive. In this case no original source of infection is discoverable. An alternative possibility is that H. J. alone suffered from poliomyelitis, that he had been a healthy carrier since leaving Brittany, and that the faucial infection and resulting reaction allowed of active infection by a poliomyelitic virus already present. On this view there is a known source of possible infection.

The question of natural susceptibility and resistance is also of considerable practical importance, although, unfortunately, our knowledge of these factors is far from complete, in this as in other infective diseases. Experience seems to indicate that there is a high resistance to infection by the poliomyelitic virus in the community at large. Unlike

measles, small-pox, and varicella, poliomyelitis will not vegetate on every soil. Here, again, there are alternative speculations. Conceivably, the great majority of infants suffer from an abortive form of the disease in early life and thus acquire that permanent immunity which known sufferers from the malady subsequently enjoy, and we know that when successive epidemics strike a community within a short period of years the victims tend to be those born since the previous epidemic. On the other hand, those who fall victims to it may belong to a group of persons, of whose existence there is some evidence, in whom the healthy nasopharyngeal secretions lack the protective bodies which healthy individuals have been found to possess. Interesting as such speculations may be, they do not provide any basis for practical action when the disease makes its appearance in a community in epidemic form.

No account of the epidemiology of poliomyelitis can fail to take account of the recent investigations of W. W. C. Topley and Major Greenwood on animal communities, and those of S. F. Dudley on certain semi-isolated human communities.

Topley's observations indicate that within an isolated community of mice the spread of an infective disease can be limited by the segregation of the members into small groups, that it is increased by the addition to the herd of fresh susceptible individuals, and that even after the infection appears to have died down, the introduction of susceptibles will cause it to flare up anew.

Dudley's observations have dealt with a series of infections, including sore-throat, influenza, mumps, German measles, scarlet fever, and diphtheria, maladies which are usually disseminated in droplets borne in the expired air of cases or carriers of disease. Knowing that the virus of poliomyelitis inhabits the nasopharyngeal secretions and is spread by human contact, it is not unreasonable to consider it as a probable example of "droplet infection." Stated very incompletely and summarily, Dudley's observations indicate that dormitory infection is the principal mode of spread, which occurs in direct proportion to the proximity of the sleeping individuals. In a mixed day- and boarding-school, diphtheria, contrary to what one might have expected, took its toll of the boarders and not of the day boys of that or of neighbouring schools. Thus, Dudley says: "In 1921 the morbidity for diphtheria at Greenwich Naval School was 1000 per 10,000, which is about 20 times greater than the estimate given above for London elementary school-children of the same age. Most of the Greenwich boys are recruited from the Board Schools, and on entry showed about the same degree of herd immunity as is found in children of the same age at these schools . . . . Therefore, when the best specimens of County Council school-boys were transferred to another type of environment they suffered from a morbidity more than fourfold that which fell on similar boys who remained in the original environment." He adds that the figures for scarlet fever are almost identical with those for diphtheria. The factor responsible for this increase seems clearly to be bed-to-bed infection in dormitories, and not class-room and play-ground infection. There are many other aspects of Commander Dudley's investigations which make them of the greatest value, but these points will suffice for my present purpose.

### *Outbreaks in Boarding-schools.*

Certain recent outbreaks of poliomyelitis in boarding-schools have brought home to us the necessity for practical measures based upon the available relevant facts of observation in respect of infective diseases. The character of the desirable measures has given rise to considerable controversy, in which authoritative opinion has been found in support of each of two rival policies. The matter is of sufficient importance to warrant some reflections.

It seems to have been assumed by both parties to the controversy that one alone of the alternative policies advocated could be right, the other being wholly and always unsound; that boarding-schools in which poliomyelitis appears must either of necessity be enclosed and quarantined, or, alternatively, must be broken up and the pupils dispersed. Surely, to take this view in the present very incomplete state of knowledge is to place a very complex situation upon the procrustean bed of an unjustified generalisation. There are obvious objections to either policy and it may be doubted whether either has a universal validity.

In the first place, it seems to me that the situation is dominated by the fact that the head of a school owes his first responsibility to the parents who have confided their children to his care. For him the safety of his little community takes precedence of that of the community at large. This may be regrettable, but, unless and until the State intervenes with a contrary policy, is inevitable and must be faced.

Starting from this assumption, is isolation of the school and quarantine or dispersal the sounder policy in the light of present knowledge? Surely, the answer to this question depends entirely upon local conditions.

From what has been said, the minimal requirements of a safe isolation of the school community are the segregation of its members into small groups, each isolated from other groups, the sleeping of the individuals under such conditions that "droplet infection" cannot occur, and the strict exclusion of fresh susceptible members for a long period after the dying out of the infection.

If these measures are not practicable, then the enclosure of the school community cannot be justified on its merits. In commentary we may say that in most boarding-schools they must prove wholly impracticable. Further, we must bear in mind that poliomyelitis may lead to permanent and severe crippling in those who survive the infection, and that with the appearance of each fresh case the period of isolation and the chances of contact infection increase. Finally, it may be asked, is it reasonable to expect a parent to allow his child to be shut up in the focus of infection of such a disease, as we know poliomyelitis to be, for an indefinite period? Each one may answer this question for himself.

Against the policy of dispersal, on the other hand, there are also grave objections. The dispersed individuals may be carriers and may spread the infection within the community at large. Such is its usual mode of spread. In assessing these dangers, as far as we can, we know that the disease is not highly infective, and that in its home the child can be so segregated on the lines indicated above as to reduce considerably the chances of spread. Finally, as we have seen, the policy of dispersal may be unavoidable when safe enclosure is impracticable, or when irrespective of this, the parent decides the matter.

It seems that the closest approach to a decision we can make is to say that under ideal conditions—and only under such conditions—enclosure of the infected school community is probably the method of choice. In all other circumstances, dispersal may have to be resorted to. In short, local conditions should decide the policy finally adopted in any given instance.

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PLYMOUTH HOSPITALS.—Thanks to the penny-in-the-pound scheme, the income of the Plymouth Voluntary Hospitals Committee has much more than doubled during the last three years. In 1926 the scheme produced £15,000 as against £6000 in 1924.

PHYSIQUE OF POLICEMEN.—The chief police surgeon for Bradford, Dr. William Wrangham, and seven medical assistants have presented a report on policemen's physique to the City Watch Committee. They state that the Bradford policeman "does not possess the stamina of the pre-war man; in other words, there has been a decline in the physical and psychic standards." Suggested steps for improvements are: Sleeping with bedroom windows open, daily physical exercise, special care of the teeth, cold baths or a sponge-down on the advice of the police surgeon, inoculation of men susceptible to cold on the recommendation of the police surgeon, and two periods of duty of four hours each separated by four hours' rest, instead of eight hours' continuous duty. The report was considered on Jan. 28th by the Organisation Subcommittee of the Bradford Watch Committee, and it was decided to seek further information as to the reason for the alleged decline. Statistics show that in Bradford there is a higher percentage of days lost through sickness than in any other town in the country except one. The figures for 1925 are said to be: Birmingham, 6; Manchester, Hull, and Cardiff, 7; Bristol, Liverpool, and Newcastle, 8; Salford, 9; Nottingham, 10; Bradford, 17; and Leeds, 19.

# SPA DOCTORS AND THE IMPROVEMENT OF NATIONAL HEALTH.*

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I PROPOSE to start by giving two texts. The first is taken from the preface to a translation of one of Dr. Carl v. Noorden's works by Dr. A. C. Croftan, of Chicago:—

"In sanatoria and in watering places too much attention is generally bestowed upon the immediate result, too little upon the ultimate effect; the most important element of the treatment being always the education of the patient not for a few weeks but for the rest of his life."

The second text is the refrain of Rudyard Kipling's verses entitled "The Heathen," "All along o' dirtiness, All along o' mess, All along o' doin' things, Rather more or less."

Whatever his previous experience may have been, the purely spa physician has to do mainly with the chronic conditions of ill-health. The duration of the actual symptoms of which the patient complains may vary from a few weeks to many years and may have been continuous or recurrent; but in any case they are rarely if ever seen at the spa in their early stages. Too often the early symptoms have been treated too lightly, and this may be quite as much the fault of the patient as of the doctor.

Early symptoms are often slight and by both doctor and patient are treated with more or less indifference. Symptoms are relieved without a proper investigation into their cause, but surely that is the time when it would be easier to effect a complete cure. If a slight fire occurs in one's house, one does one's best to put in out as quickly and as effectually as possible. In the body the *slightness* of a morbid condition and not the morbid condition itself seems to be dwelt upon, and vigorous and, if necessary, sustained methods are not made to eradicate it entirely. For this, as I have said, the doctor is not wholly to blame. Too often if he tries to press upon the patient the importance of getting at the cause of some slight affection, he is thought to be making a fuss, but the fact remains, if a patient has a pain he asks only, as a rule, the relief of the pain and not of the factors that have caused it and so on.

## FACTORS OF DISEASE.

As regards the factors of disease, with the exception of trauma and acute infections and some of the diseases which arise from occupation and environment, I think it will be generally agreed that chronic sepsis, especially sepsis of the upper part of the digestive and respiratory tracts, and faulty habits, are the causes of most of the morbid conditions of middle and advanced age. In a sense one would say they are due entirely to faulty daily habits. If this suggestion is correct that chronic sepsis and faulty habits are responsible for most of the morbid conditions which we are called upon to treat, it is necessary that the spa physician should make a careful study of daily habits—all habits, but especially of food habits—though clothing, exercise, ventilation, and so on are also most important. He should be familiar with the régime of the nursery, as in the nursery habits are acquired that persist through life. This is one reason why it is desirable that the spa doctor should not specialise until he has had some years of general practice. As food and raiment are important, he should know more about them than he can have learnt at any medical school. He must become acquainted with all the factors that can cause chronic disease—that is, if his aim at the spa is not merely to treat symptoms and get a temporary improvement but to secure as far as he can permanent cures. It is the whole condition of the patient and not his symptoms that requires treatment. A man is not suffering from high blood pressure or from fibrositis, but from the general deterioration of the body, the result of factors which have usually been in operation for a considerable time and which are most often still in operation. I often say, when I hear that so-and-so has died from pneumonia, that he did not die from pneumonia but from the condition he was in when he got pneumonia. It is not the last straw which breaks the camel's back, though we sometimes talk and act as though we believed in that misleading proverb.

Then again, in the disease which occupies so much space in the public view—cancer—the idea that is held by some surgeons that cancer can occur in the perfectly healthy body is, in my experience, absurd. Because a man has not complained of symptoms, it does not show he is healthy. I have seen a large number of cases of malignant disease in general practice, and since I have been in spa practice have often been the first to discover it. But never yet have I seen it except in a body in which there is already a more or less general fibrosis, and I think it is possible that we at the spas, better than any others, may be able to throw light on the precancerous condition.

## CHRONIC SEPSIS.

Now I will come to the gist of my address. If we are agreed that the illnesses of middle life and old age are due to chronic sepsis and the gradual accumulation of toxins and waste matters in the body, with the gradual deterioration that comes from faulty habits, is it not of vital importance to us that we should be agreed as to the prevention and treatment of sepsis, and as to what should be the daily habits of the civilised man?

I want to suggest that it may be a useful work in this section to arrive at agreement as to what we should teach, so that the layman should not be able to say, as he glibly does say, "But you doctors do not agree amongst yourselves and you tell us to do things, but do not practise them yourselves." These reproaches are too often merited. Why cannot we do our best to wipe them out?

Taking the two things that I have suggested as the main factors of middle-age disease—chronic sepsis and faulty daily habits—in order, the commonest form is dental sepsis, which is more or less generally recognised. But the factors that caused it began in the nursery. Dental sepsis itself in the form of marginal gingivitis is very common in children in early life and it is not adequately treated. Over and over again when there has been a general septic condition affecting all the teeth I have known three or four of the worst teeth to have been removed and a vaccine, absolutely useless in my experience, to be made and injected, but the other septic teeth are permitted to remain. In cases of sepsis it is surely not a question whether the sepsis is advanced or not, it is its presence. This habit of half removing sources of dental sepsis is as foolish as it would be, if one's house were on fire in several rooms, to put the fire out in three rooms and leave it burning in two others where it was not burning so fiercely, and had not done so much damage.

Another point about dental sepsis: it is the fashion now, even when septic conditions are obvious to the eye, to have the teeth radiographed and, if there is not much obvious destruction of bone or apex of tooth, not to regard the condition seriously. But septic conditions round teeth can exist for years before any change is shown in bone or teeth. As in the case of a fire it is not the damage already done that is most important, but the damage that must result if the fire is not completely extinguished.

It has been alleged that the treatment of dental sepsis has often resulted in no improvement to the patient. I attribute the failure in many cases to the fact that the treatment has not been radical. Some

* Being the presidential address delivered to the Section of Balneology and Climatology of the Royal Society of Medicine.

years ago Mr. St. John Steadman read a paper at the Odontological Section of this Society on a case of rheumatoid arthritis twice cured by dental treatment. My comment was that the teeth he took out on a second occasion were septic when he made his first extraction, hence the recurrence of the symptoms. Secondly, it is, of course, absurd to suppose that the extraction of teeth in itself is anything but harmful. We have all come across cases when even the extraction of three or four teeth—the extraction of many teeth at a time should always be avoided—has caused an exacerbation of symptoms. Further, a complete eradication of dental sepsis, though it provides for future safety, cannot possibly do anything to undo the damage already done.

May I venture to quote two extracts from the Transactions of the Royal Society of Medicine [1]:—

"Another point to be remembered is that the longer the source of sepsis is permitted to remain the greater the damage to the tissues. In young adults most marked and rapid improvement in a general condition will often follow dental treatment, while in those of advanced years the improvement is often slow and not so complete. This difference is naturally to be explained by the fact that in the young the tissues have not been damaged beyond recovery, whereas in those of more advanced years the tissues are damaged beyond repair. This, to my mind, is a most important point and with increasing knowledge of these cases I think the tendency will be to insist more and more on the early removal of teeth in cases of dental sepsis, and so place the patient, so far as the mouth is concerned, in a safe position."

Again, in the discussion on a paper by Dr. (now Sir) Thomas Horder [2]—

"Dr. Ackerley expressed his general agreement with Dr. Horder that oral sepsis, especially when chronic, had most serious results on general health, and was, he believed, a large factor in many of the diseases of middle life and old age, especially those in which fibrotic changes were a marked feature. How far it was a factor could be known only to those who insisted not on its partial but on its entire removal. He could not quite understand the attitude of those who allowed a septic condition to remain in the mouth because they doubted whether the results were as serious as had been suggested. He thought their duty to their patients was to give them the benefit of the doubt, and to remove a potential source even if they doubted its being the actual source of disease. No one would suggest that a septic mouth was conducive of health."

Cannot we, at some time, come to an agreement as to what our duties ought to be with regard to dental sepsis. It will certainly be necessary if the spas take up the treatment of insured persons, to provide for the treatment of dental and other sepsis. To me this presents considerable difficulty, as over and over again I have been assured by patients that their dentists have pronounced their mouths free of disease when sepsis has been neither slight nor obscure.

## FAULTY DAILY HABITS.

I now come to the question of daily habits. The first thing that occurs to one is, what should be our teaching as to habits of eating and drinking? It used to be a habit, and still may be a habit at some spas, for doctors to have lists of all sorts of likely and unlikely foods provided, underlining various articles as desirable, others as permissible, and others as forbidden. I have seen many of these lists and have often failed to understand on what process the selections were made. In my own practice I find it is rarely necessary to prohibit any natural foods *if plainly cooked*. Sugar and condiments, &c., I cannot regard as foods. But I often find myself saying, "It is far less important what you eat than how you eat it." Food habits are important. It would be a great boon to ourselves and to our patients if we could be agreed on our teaching regarding them. Are the usual four or more meals a day good for the child and the apparently healthy? Or is the very frequency of meals, for years, one of the causes of the dyspepsia of middle life, for in middle life the eupeptic individual is hard to find. There may be no complaint of indigestion if one asks a patient, but there is constipation and flatulence, all serious signs of faulty digestion, in almost every patient one sees and examines carefully. Is the usual afternoon tea with its cakes and sweets the harmful thing that our friend Dr. Leonard Williams suggests? I may say I am in full agreement with him. Is the habit of eating and drinking together a habit common to civilised human beings, but I am told practically unknown among wild animals, right or wrong? Not only does the wild animal not eat and drink together, but if a man had a valuable horse likely to be a Derby winner, he would not allow it to be fed and watered at the same time, and if the mastication and insalivation of food are essential to digestion. I venture to repeat a remark I made at the discussion on Alimentary Toxæmia, "that perfect insalivation does not occur when food and drink are taken together." I think the researches of Pavlov will confirm this. Then, too, can we not be agreed about some important articles of food? Is it of vital importance that a whole meal bread and not the emasculated substance usually called bread, should be eaten by young and old? To help to prevent goitre, should children have iodised salt or have the iodine contained in the outer part of the grain of wheat? Is sugar—I mean refined sugar, not of course the natural sugar that is in fruits or honey—good or harmful? Is it harmful only when the middle-aged man or woman is ill, or is it harmful before he becomes ill and was it one of the factors causing his ill-health? Are beef and veal harmful to the Englishman and innocuous abroad? And is mutton so much more wholesome than beef? Hutchison suggests not. But he does not point out that the Englishman eats mustard or horse-radish with his beef—nasty pungent substances which irritate the palate and stomach. May I be permitted to interpolate here an observation that is not strictly à propos on the question of butcher's meat. Fourteen years ago when I was in Egypt I began to notice the fat of meats. There were there two sorts of beef, one local, the meat of a small animal not overfed with very little fat, and cold-storage meat, laden with fat, the source of which was, I believe, mostly Austrian. I cannot vouch for this, but whatever its source it was especially provided for the English consumer. As regards the flavour of the fat of the two kinds of meats, the fat of the Egyptian animal was far more tender and far more palatable. When I returned to England I began to notice the fat of English beef and mutton, and found similar differences. The fat of the Welsh sheep picking up its food naturally on the hills, and not penned nor artificially fattened, is lighter in colour and far less fibrous than the fat of mutton I see in London. The same applies to the difference between naturally fed and artificially fed beef. The most disgusting fat I ever saw or tasted was from a prize beast fattened for the Christmas show. I venture to suggest that the fat of artificially fattened animals and birds is like the fat of obese fibrotic men or women, and that it contains toxins that must be harmful if ingested.

Is milk a proper food for the child and the adult? How curious it is that except for man and the few animals to whom he gives it, no animal gets milk except at the suckling stage and only gets it then in such a way that it must be mixed intimately with saliva provided by mother nature so abundantly in the young that young animals have slobbery mouths. Are the usual condiments so often forbidden when dyspeptic conditions are established or the kidneys affected only harmful then or were they factors in causing the dyspepsia, &c.? Again, is the addition to almost all our food of one particular crystalline mineral salt, sodium chloride, a substance the body

[1] Colyer: Discussion on Alimentary Toxæmia, Proc. Roy. Soc. Med., March, 1913.
[2] Dental Sepsis from the Point of View of the Physician, Odontological Section, Trans. Roy. Soc. Med., 1913–14.

hates and detests so greatly that it tries to eliminate it as rapidly as possible, essential or useful—or is it, as an increasing number of us believe, a substance that from its insistence on being eliminated, interferes with the elimination of other waste matters from the tissues?

I do not wish to labour the question of habits but one or two others are of paramount importance.

### DEFECTIVE OXYGENATION.

It is more or less being recognised that in middle life and old age defective oxygenation is a large and important factor. It has occurred to me from clinical observation that toxins, of which we know so little, are like diamonds, very difficult to burn up. The toxin-filled body needs far more oxygenation than it gets or can get. It cannot get it first, because from the fact that nearly all the activities of the upper part of the body are in the front of the body, and from defective daily exercises, the expansion of the chest diminishes as years increase; and secondly, ill-ventilated rooms with their moist stagnated air are a further bar to oxygenation.

Can we not be agreed and earnest in our teaching to secure full oxygenation of the body? We shall not do this as long as we shut our own windows and while professing to like fresh air, have a dislike to moving air and call it a draught. As Luciani, the Italian physiologist says, "It is an undeniable fact that the oxydising process is the most important in the animal body."

### WATER.

Before I pass entirely from food, may I mention the question of water? I have suggested elsewhere that the ingestion of hot water and hot sloppy drinks are entirely harmful, and shortly after I wrote my paper on that subject I found that the brothers Mayo in papers they wrote in 1915 and 1918 attributed the increase in cancer of the stomach largely to the ingestion of hot drinks; and also Mr. Stuart Low has regarded cancer of the gullet as probably partly due to hot food. Yet I constantly find that doctors, including, I think, some here present, advise the taking of hot water the first thing in the morning and at other times. No animal in creation except man ever swallows anything hotter than its body, and even the domestic dog has a dread of hot food. What is the right procedure? If hot drinks are wrong, think of the millions of wrongdoers in this country of ours! The fact that one million or one hundred millions of people do a foolish thing does not make it wise or good.

I mention these things—there are plenty of other things one could speak of if there were time—simply as part of my plea, that we should be agreed as to our teaching and not differ on matters of real importance. When in a paper I read in this Section on Fibrositis I endeavoured to show how gradually the body of a young child described by Dr. Leonard Hill as "a glorious and perfect machine, the heritage of millions of years of evolution," became a dirty body full of toxins and waste products with tissues hardened by the retention of those toxins, I was twitted by Dr. Leonard Williams with having given a lecture on the laws of health. But it is precisely because spa doctors see more than anyone else the results of the violation of these laws that they should become more than others teachers and upholders of laws. *Gutta cavat lapidem non vi sed sæpe cadendo.* Why should one run, say, a valuable motor-car with every attention to detail and be careless how one runs a much more complicated and valuable machine, the human body.

As all present know there is a suggestion that the industrial classes should be treated at the spas. Is the treatment to be palliative or is it to be radical? If only palliative, if only the actual temporary disablement is to be attended to, and no proper attempt is made to get at the factors that cause disablement, after a few years I feel sure, to put it in a modern phrase, the insurance societies will not find it a paying proposition. But if we take the line I suggested some years ago with reference to fibrositis for "complete cure and not for mere temporary relief, we must attend to all and not to one or two causal factors. It is the underlying condition and not some of its results that requires radical treatment," and acting on that we teach our patients not for a few months but for the rest of their lives, I think, that more and more the desirability of spa treatment for rich and poor would be recognised and we should have done not a little to improve national health. Of course the moment we begin to try to alter people's habits we shall begin to have trouble. May I tell you a little story? Many years ago a man about 55 went down to Llandrindod and met in the smoking-room of a hotel a friend of mine. He said he had come down to get treatment for gout and asked my friend if he knew any doctor he could recommend. He suggested myself. The patient, corpulent, plethoric, dyspeptic, prematurely old and very sorry for himself, came to see me. A day or two afterwards my friend met him again and learned he had been to see me. "And how did you like Ackerley"? "Not at all" was the reply. "He is the most impudent fellow I ever met. I came down here for baths and the waters for my gout and that fellow wanted to interfere with my habits." The story suggests the dangers we run if we try to alter habits, but surely the business of our profession should not be to get people out of ditches into which they have fallen, but to prevent them falling into ditches? As we have to earn our living from our work an old rhyme occurs to me—

> Tickle the Public and make them grin.
> The more you tickle, the more you'll win.
> Teach the Public, you'll never grow rich.
> You'll live like a beggar and die in a ditch.

But my own feeling is that when the public realise more and more the anxiety of a doctor to keep them in health the more they will consult him and the more they will trust him. Of course foolish people and those of our own profession who have acquired the habit of doing and advising "rather more or less" will call us faddists, but we need not be troubled by that. Semmelweiss and Lister in our own profession were denounced as faddists. It is true that the one was martyred—but the other was canonised. So Lord Wolseley was denounced as a faddist, but the people who denounced him would have produced an army in 1914 little better equipped and accoutred than Wellington's army in the Peninsula. To those who say they cannot be bothered about rules of living, they do not want to think about their bodies, my reply is that if they do not think of the body the body will sooner or later make them think about it. It is a fact when habits are acquired we do not think of them, we perform them unconsciously.

In conclusion, may I say, that our teaching must be with conviction; that is one of the main reasons why I plead for agreement between ourselves, what we shall preach and what we shall practise, and as in the physical body and in the body politic much harm ultimately results from half doing things and allowing the little evil to remain until it has become a great evil. Let us, as Kipling says, "Keep away from dirtiness, keep away from mess, Don't get into doin' things rather more or less."

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**FRENCH HONOUR FOR DUBLIN SURGEON.**—The Government of the French Republic has conferred the decoration of Officier de l'Instruction Publique on Mr. William Doolin, F.R.C.S.I., in recognition of his services to French medical science and the development of fruitful relations between the Irish and French medical circles. Mr. Doolin is editor of the *Irish Journal of Medical Science*, and recently represented the Royal Academy of Medicine in Ireland at the Laennec Centenary Celebrations in Paris.

# PULSATION IN THE SUPERFICIAL VEINS OF THE EXTREMITIES.

## WITH DESCRIPTION OF A CASE.

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PULSATION in the superficial veins has always interested both clinician and physiologist, doubtless because it is easily observed. Such pulsation is not commonly seen in the veins of the extremities, and the following case is recorded both for its comparative rarity and the unusual features presented. No useful purpose would be served by attempting a complete review of the literature, as full accounts have been given by Mackenzie[16] in 1894, in his exhaustive paper the Venous and Liver Pulses and Arrhythmic Contractions of the Cardiac Cavities; and more recently by Kerr and Warren.[14]

The earliest record of peripheral venous pulsation I have been able to find is that of Hombert,[12] cited from Friedreich,[5] who, in 1704, described pulsation in the veins of the neck and arms of a patient during periodic asthmatic attacks. In 1757 Albert Haller[10] referred to a patient who presented pulsation in all the superficial veins of both upper and lower limbs, the condition, we are told, being found on post-mortem examination to be due to the presence of "polypi" within the beginning of the pulmonary artery obstructing the outflow of blood from the right ventricle. Isolated cases were described in the early part of the nineteenth century, the earliest by Zulian[29] in 1805. Friedreich[6] in 1867, quotes Mavey, who with Goubler and Verneuil noted pulsation limited to the varicose veins in one leg, an observation presenting at least one feature in common with the following case:—

### *A Case of Peripheral Venous Pulsation.*

A married Jewess, aged 52, first came under the care of Dr. Lewis Smith at the London Hospital in July, 1919, when she was admitted for cardiac failure. She had been quite well until two years before, when she began to complain of a cough and shortness of breath on exertion. Two weeks before admission her symptoms became much worse. Swelling of the feet, epigastric discomfort, and palpitation kept her awake at night. She had no history of rheumatism, chorea, or other illness. Of seven children all were alive and well, and she had had three miscarriages.

At this time the patient was a thin, tired-looking woman in obvious respiratory distress. She was slightly cyanosed and her feet were moderately œdematous. The pulse was small and completely irregular, both in rhythm and force; the rate at the wrist was about 78 per minute. The apex-beat was in the seventh space, four and a half inches to the left of the mid-sternal line. Both cardiac sounds, completely irregular, were audible in all areas. A presystolic murmur at the mitral area was described in the notes. The lungs were clear, except for a few inspiratory bubbling crepitations heard at the left base. The lower edge of the liver was felt one inch below the costal margin in the right mid-clavicular line, and there was slight tenderness on deep pressure over it. Hepatic pulsation was not recorded, nor was reference made to pulsation in any superficial veins. There were varicose veins on both legs. A diagnosis of mitral stenosis and auricular fibrillation was made, and after three weeks in bed on digitalis the patient was discharged much improved. She remained under observation as an out-patient, and except for occasional attacks of breathlessness, which were readily improved by digitalis, was able to carry on with her housework and the nursing of an invalid husband.

In August, 1924, on rising from bed, she found that her mouth was drawn to the right side, and her left arm and leg were paralysed. Consciousness was not lost, and after some hours she regained the use of her limbs. Two similar but slighter attacks followed within the next three months from which she made a complete recovery.

In June, 1925, one of the veins over her left tibia ruptured and she was readmitted to hospital. Her breathing was laboured and she was cyanosed; the ankles and shins were slightly œdematous. The apex-beat was diffuse, heaving and disorderly, in the seventh space in the mid-axillary line. At the mitral area the first sound was followed by a long blowing systolic murmur conducted out to the left axilla, and the second sound by a long diastolic murmur. These murmurs were less distinct in other præcordial areas. The lungs, except for a few crepitations heard over the bases, were clear. The superficial veins of both legs were exceedingly varicose, tortuous, and prominent, the larger of these in the left leg measured fully half an inch across. It was then noticed that they were visibly pulsating, and more careful examination of other superficial veins—viz., of the temples, neck, arms, dorsum of hands, chest, thighs, and feet—showed similar but less marked pulsation. The liver edge was now four inches below the costal margin in the right mid-clavicular line, and there was distinct pulsation on palpation. The urine was free from albumin and sugar. The patient rapidly improved with rest, and was discharged after ten days.

From that time she has been able to carry out her usual household duties, although with any attempt to exert herself beyond the ordinary, dyspnœa and palpitation caused enough distress to necessitate resting in bed for several days. Under such circumstances the patient was readmitted to hospital on three subsequent occasions. The predominating features always remained the same, and the venous pulsation was constantly noticed.

FIG. 1.

Electrocardiogram showing auricular fibrillation, small amplitude of ventricular complexes (R), and an ectopic ventricular beat.

She was last readmitted on July 23rd, 1926, in a condition much the same as before. There was a little orthopnœa, slight cyanosis of the lips, the respiratory rate being 20 per minute. The lungs were clear and have remained so throughout. The pulse was completely irregular in rhythm and in force; the rate on admission was about 60 per minute—she had been taking digitalis at home—and in hospital it remained about 70. The arteries were thickened and the blood pressure (brachial) was approximately 140 mm. Hg systolic and 80 diastolic. There was extensive and heaving pulsation of the whole præcordia; the apex-beat was in the seventh space in left mid-axillary line, and the pulsation in its neighbourhood had a wavy appearance. The fifth to the eighth intercostal spaces inclusive in the left axilla showed well-marked retraction with each cardiac systole. The area of cardiac dullness reached upwards to the level of the upper border of the third costal cartilage, on the left to the apex-beat, and on the right to half an inch external to the right border of the sternum. A long diastolic thrill was palpable over the apex. At the mitral area no first sound was heard, but there was a long systolic murmur conducted outwards; the second sound was accentuated and followed by a long diastolic murmur. At the aortic area both sounds were present and distinct. The electrocardiogram (Fig. 1) shows auricular fibrillation, small amplitude of the Q.R.S. complexes, and ectopic ventricular beats.

A radiogram (Fig. 2) was made by Dr. M. H. Jupe, to whom I am indebted for the following report:—

"The film shows an enormous heart whose border extends fully to the left wall of the chest. The size is due to an enlargement of all chambers, particularly of the left ventricle. There is no evidence of dilatation of the superior vena cava. The appearance is such that would be expected to result from extensive pericardial thickening and adhesions to surrounding structures. The very gross pulsation of the whole chest with each cardiac impulse, with the great size of the heart, together made it unusually difficult to obtain a good film."

The superficial veins of the limbs showed pulsation as noticeable as on former examinations. In the left leg this could be distinctly seen at a distance of five feet from the

bed. The venous pulse was approximately synchronous with the arterial pulse. On raising either arm or leg to a height of 12½ inches above the chest wall, with the patient in the recumbent position, the veins became empty and pulsation disappeared; maximal pulsation was observed at a height of 11 inches above the level of the chest wall. After a segment of vein had been emptied by stroking with one finger it rapidly filled from the distal end, when filling from the proximal or cardiac end was prevented by digital pressure. Pulsation, however, did not return until the proximal obstruction was removed, this showing that the pulsation was centrifugal—i.e., propagated from the heart to the periphery. A systolic shock could be heard over the larger veins on auscultation with the stethoscope. Fig. 3 shows a tracing from one of the tributaries of the left internal saphenous vein. The venous wave is seen to occur slightly later than the radial pulse. Examination of the fundus oculi at no time revealed pulsation in the retinal veins. The liver was enlarged as before and pulsated synchronously with the apex-beat. Bimanual examination showed the pulsation to be expansile, and on one occasion examination in the "knee-elbow" position did not alter its degree. There was no œdema of the extremities. The amount of urine averaged 40 ounces in the 24 hours and contained no albumin. The Wassermann reaction was negative.

The patient was discharged on Sept. 17th and remains under observation. Her general condition is still fair and the physical signs unaltered.

*Diagnosis.*

In discussing this case we must consider (*a*) the interpretation of the cardiac physical signs above described, (*b*) the cause of the pulsation of the veins, and (*c*) what light, if any, is thrown upon the significance of abnormal venous pulsation in general.

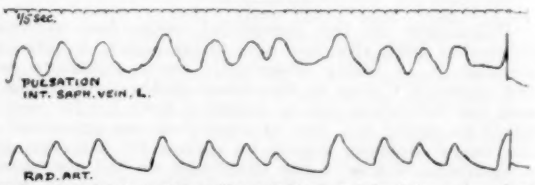
*Cardiac Lesions.*—There can be little doubt the case is primarily one of mitral stenosis and auricular fibrillation. The electrocardiogram and the polygraph tracing which shows the absence of "a" waves confirm the diagnosis of fibrillation. The degree of cardiac enlargement, the large area of systolic retraction of the chest wall, the wavy character of the cardiac pulsation, and the radiographic appearance of the heart, all point to the presence of old obliterative pericarditis with extensive adhesions to surrounding structures. Such a condition could be simulated only by pericardial effusion or aortic incompetence. The former is excluded by the duration of the signs, the general condition of the patient, and the radiogram; in support of the latter there is no direct evidence on examination.

FIG. 2.

Radiogram showing extreme enlargement of heart both right and left. The cardiac outline is seen within the shadow of the large mammæ.

Apart from the abnormal condition of the veins and the liver, there is little evidence of a *gross* tricuspid regurgitation. A separate and distinct tricuspid murmur was never heard. The size of the right heart is by no means out of proportion to the general increase in the size of the whole heart. The other clinical features of gross tricuspid incompetence are conspicuously absent. Considering the great degree of general cardiac disability, there was always remarkably little cyanosis, and except under conditions of stress, little dyspnœa. The lungs were almost free from congestion, and œdema of the legs was not present during her last stay in hospital. The veins of the face and neck were not distended during periods of rest, and Bamberger's jugular bulb was never present. The urine was never abnormal. It will be observed, however, that I have qualified the term tricuspid regurgitation by the adjective "gross," for there is reason to believe that minor degrees of regurgitation at this valve are by no means uncommon. At autopsy, lesser endocarditic changes are commonly found in the tricuspid valve of hearts showing the more obvious pathological lesions of the mitral valve and pericardium. Thus, at the Pathological Institute of the London Hospital, it was found that in 51 consecutive examinations at which mitral endocarditis was found, 22 (42 per cent.) showed organic changes in the tricuspid valves. The frequency with which this valve is affected in acquired heart disease seems from the general descriptions in text-books to be insufficiently recognised. Moreover, quite apart from the lesser degrees of regurgitation occurring as the result of organic changes in this valve, it is well recognised that incompetence may readily occur in a normal heart under conditions of the slightest strain on the right ventricle—long, indeed, before such strain is great enough to produce abnormal objective signs in the patient. John Hunter [13] and Richerand [14] both considered the tricuspid valve to be naturally incompetent, and Wilkinson King [15] in his classical experiment on the dead heart showed that this valve would not prevent the regurgitation of water even under moderate tension.

FIG. 3.




Polygram showing, above, the pulsation obtained from a receiver applied to a tributary of the left saphenous vein above the ankle and, below, the irregular radial pulse.

*Conditions giving Rise to Abnormal Venous Pulse.*

There are two main types of venous pulsation in the peripheral veins—viz., the centripetal and the centrifugal.

*Centripetal Pulse.*—In this type the pulse wave is propagated from the periphery towards the heart, and nearly all the recorded cases of peripheral venous pulsation are of this nature. Moreover, it is now well established that it may occur in both normal and abnormal states. Thus Wilkinson King [15] observed it in himself after taking a heavy meal, and discussed its occurrence in the limbs as the result of warmth and exercise. Similar observations were made by White [28] and others. Such pulsation has also been described in a variety of pathological conditions—e.g., neurasthenia, chlorosis, fever, and (most often) in aortic incompetence. Both Quincke [22] and Broadbent [2] described it in such cases, and recognised on clinical grounds that it was due to the transmission of the pulse wave in the arterioles, through the capillaries to the veins. This has also been demonstrated experimentally. Palmer [21] produced it in a frog's leg by obstructing the venous

return, and Claud Bernard[1] obtained pulsation in the veins of the submaxillary salivary gland as the result of dilatation of the arterioles following stimulation of the chorda tympani nerve.

*Centrifugal Pulse.*—This is the form occurring in the case above reported. For the most part it has been ascribed to tricuspid regurgitation—the immediate retrograde propulsion of blood from the right ventricle to the right auricle and thence to the great veins—and no doubt this is the simplest mechanical explanation. It is now well recognised, however, that such pulsation may occur quite independently of any tricuspid lesion. Vaquez[26] emphatically declares that the examination of the venous pulse gives no indication whatever of the condition of the tricuspid valve. Graves,[7] cited by Mackenzie,[16] attributes this form of pulsation to the independent contractility of the walls of the veins themselves. The ability of the great veins to contract was first described by Haller[8] in 1757. Brunton and Fayrer[3] demonstrated such contractions in the pulmonary veins of a cat, and McWilliam[18] described a rhythmic contractile state of the ostia of the great veins in fish.

*Two Varieties of Centrifugal Venous Pulse.*

Analysis by means of polygraphic tracings has resulted in the recognition of two forms of centrifugal venous pulse.

1. *Negative or Auricular Form.*—The part played by the right auricle in the production of venous pulsation has long been known. Haller[8] and other physiologists asserted in the middle of the eighteenth century that the auricles could discharge blood backwards into the veins, and Morgagni[20] recognised clinically a venous pulse resulting from this. Indeed, Potain[32] described such a pulse in the neck veins of normal individuals, which from inspection alone he recognised as being presystolic in time. Further, Eichorst[4] noted a similar pulse in the veins of the forearm of a patient who had heart failure but no clinical evidence of tricuspid incompetence. The jugular tracings in cases with a negative venous pulse show an "a" wave which may or may not be exaggerated.

2. *Positive or Ventricular Form.*—This is characterised in the tracings by a large premature "v" wave, and absence of the "a" wave. For a long time this type of pulsation in the veins was considered practically pathognomonic of tricuspid incompetence. This view seems to be supported by Kerr and Warren[14] and Middleton,[19] who have described pulsation in the superficial veins of the upper extremities of patients suffering from advanced cardiac decompensation and manifesting features of tricuspid incompetence—e.g., evident cyanosis, gross œdema, pulmonary congestion, and albuminuria. But evidence accumulates showing that tricuspid incompetence is by no means an invariable factor in the production of this type of pulse. Friedreich,[5] basing his views on a considerable number of cases, came to the conclusion that its occurrence was independent of any valvular lesion. Rihl[25] arrived at the same conclusion by experiment. On the other hand, the importance of the right auricle in this connexion has received greater recognition since the pioneer work of Mackenzie[16] and Hewlett.[11] The part it plays in the production of the negative form of pulse has been referred to already.

Mackenzie[17] describes three conditions in which the ventricular or positive venous pulse may occur: the onset of auricular fibrillation (by far the most common), great distension of the right auricle, and certain forms of regular tachycardia where the contractions originate at some abnormal site in the genetic system. Whatever the condition, the one constant factor is engorgement of the right auricle with stasis of the blood stream passing through it. In certain forms of tachycardia and occasionally in heart-block, the simultaneous contraction of the auricle and ventricle results in an overlapping of the "a" and "v" waves, so producing one large wave in the phlebogram. This, as has been shown by Hewlett, Mackenzie, and others, may produce abnormal visible pulsation in the neck veins. But with a dilated and engorged right auricle a similar pulsation may occur apart from such a mechanism. As Mackenzie[16] first pointed out, the "v" wave in normal jugular tracings is due to the overfilling of the right auricle from the veins at the end of ventricular systole. Where the auricle is in a constant state of engorgement and stasis, this wave will be more prominent and occur earlier in the cardiac cycle. But I do not think that this in itself would be enough to account for any well-marked pulsation, and a more important factor must be considered. In normal circumstances the auricles are more or less empty at the beginning of ventricular systole, but in conditions where the auricle is constantly distended it will act like an inflated balloon, and readily transmit to veins communicating with it any impulses received from adjacent structures. Thus the explanation offered by Vaquez[26] seems both simple and probable. According to him, this form of venous pulse is produced by the retrograde shock received by the dilated right auricle from the contracting right ventricle, this shock being transmitted through the auriculo-ventricular wall, and may thus occur in the absence of any tricuspid lesion.

*Friedreich's Sign.*—One other cause of pulsation remains to be considered. In the forms already mentioned the pulsation was due to a distension of the walls of the vein during cardiac systole. Friedreich[6] described, in patients having pericardial adhesions, a pulsation in the neck due to an emptying of the veins during diastole with consequent collapse of their walls. This has been confirmed by later observers. Such a diastolic collapse would, by increasing the difference in venous pressures during systole and diastole, exaggerate any existing tendency to pulsation from causes already mentioned. The explanation of this phenomenon first offered by Friedreich seems most probable. Owing to adhesions of the pericardium to the anterior chest wall, the latter is forcibly drawn inwards with each cardiac systole. At the moment this ends, the elasticity of the chest wall causes it to recoil briskly, resulting in a lowering and flattening of the dome of the diaphragm. This pulls the heart down and increases the negative pressure within the thorax so determining a collapse of the veins during diastole. The effect of this mechanism would be further supplemented by adhesions of the walls of the right auricle to surrounding structures tending to keep this chamber dilated.

*Mechanism of Pulsation in the Case Described.*

We may now consider to what factors may be attributed the striking pulsation described in our patient. Its wide distribution and the fact that it is best seen over the anterior surface of the tibia excludes the possibility of transmission by contact with the large arteries. Contraction of the veins themselves does not, so far as is known, produce venous pulsation in man. As previously pointed out, the pulsation in our patient is centrifugal, and the polygram shows it to be of the "positive" or "ventricular" form. Although manifestations of a gross tricuspid incompetence are absent, we have just those conditions which would favour stasis and great distension of the right auricle—namely, old-standing mitral stenosis with auricular fibrillation and resulting venous stasis. The presence of adhesions anchoring the external walls of the auricle to surrounding structures must also be considered as a likely factor in maintaining dilatation of this chamber. Although the venous pressure was not measured accurately, the height above the chest wall at which the veins of the forearm are seen to collapse, is always a useful indication of the degree of stasis in the right auricle. The normal level, though somewhat variable, is generally about 5 or 6 inches. As already pointed out, this height in our case was 12½ inches. It is just under such conditions that the retrograde shock from the contracting right ventricle would

have its maximum effect on the right auricle and on the veins opening into it. This would be further enhanced by the hypertrophied walls of the right ventricle, such as we know occurs in long-standing stenosis of the mitral valve.

The "v" wave in this case occurs very early in the cardiac cycle and this is a common feature of auricular engorgement. Normally it results from an "overfilling" of the right auricle towards the end of ventricular systole, but when the auricle is constantly full, as must be the case here, the effect of overfilling will manifest itself by distending the cervical veins at the beginning of ventricular systole. At this time, too, the retrograde wave from the contracting right ventricle will be transmitted to the jugular veins, and tend to overlap and reinforce the "v" wave due to auricular "overfilling."

Although auricular stasis would explain the mechanism by which the pulsation is propagated to the veins, it seems hardly enough to account for the extent and degree to which it is observed in this case. Two contributing factors must be considered:—

(*a*) *Adherent Pericardium.*—Evidence proving the presence of an adherent pericardium has been given, and the effect of this on any tendency to venous pulsation has been discussed.

It was observed that when this patient was at rest the cervical veins were at no time markedly distended, whereas during diastole distinct flattening occurred. Little attention has hitherto been given to the part played by pericardial adhesions in abnormal venous pulsation. Many, indeed, have denied it. This is certainly not a constant factor, but it is at least significant that in a series of ten consecutive cases in which definite abnormal venous pulsation in the neck was recorded, and in which the heart was examined at autopsy, pericardial adhesions were present in six of them, and in two of these cases there was no evidence of a tricuspid lesion either during life or at necropsy.

(*b*) *Varicose Veins.*—Attention has also been drawn to the great varicosity of the veins of the legs. Varicose veins have long been attributed to a congenital weakness in the structure of their walls, a deficiency in the function of their valves, or both. There is, therefore, some justification for considering that there may be a general incompetence of all the veins in this case. The importance of local changes in the veins themselves as a factor in venous pulsation was fully discussed by Friedreich[5] who refers to a case described by an earlier writer, in addition to several he himself observed. It seems not unreasonable to suppose, then, that the marked heave of the venous impulse, as seen in the legs, for example, may be partly explained by the state of the veins themselves.

The question of the liver pulsation is beyond the scope of this paper. It is now well established that it is always similar in character to the centrifugal venous pulse in the neck, and depends upon the same mechanism for its production. Acting like a sponge it rapidly becomes distended with blood as soon as sufficient stasis and congestion in the right side of the heart occurs. Wenckebach [27] has shown that this is always more marked in those cases where the pericardium is adherent. Any change in venous pressure within the right auricle will be readily transmitted to the liver by the large hepatic veins with which this chamber is in direct communication.

An interesting point already noted was the absence of pulsation in the retinal veins in this patient. As a rule, where the pulsation in the peripheral veins is well marked, a similar pulsation is seen in the retina. As was suggested by Dr. Lewis Smith, the large cavernous sinus with its rigid walls may well absorb much of the force required for propagating the venous stream backwards, and so the pulsation reaching the very small retinal veins may be reduced to a minimum.

### *Prognosis.*

No description of such a case as this would be complete without some reference to prognosis. Hitherto venous pulsation occurring in the extremities has always been regarded as evidence of advanced heart failure and of grave prognostic significance. The following statement by Kerr and Warren[14] seems to represent the general opinion: "Pulsations elsewhere than in the neck and basilic veins, veins of the hand, and the retinal vessels, seem to be uncommon in our experience, except in cases of marked decompensation with pronounced regurgitation and engorgement. In all such cases the prognosis was very bad and the patient died soon after. In this they resembled the cases in the literature." In the case above described pulsation has been observed for over 18 months, and it is quite possible that it existed before then. As her condition is at present not much worse than it was when pulsation was first noted, it must be concluded that venous pulsation in the extremities is not necessarily incompatible with a continuance of life for a period of many months.

### *Summary.*

A case is described of auricular fibrillation, mitral stenosis, and adherent pericardium, exhibiting remarkable pulsation in all the superficial peripheral veins. The absence of clinical features suggesting gross tricuspid incompetence is noted. The more important causes of general venous pulsation are discussed, and evidence is adduced to show that tricuspid regurgitation is neither a constant nor an important factor.

A combination of (1) stasis and engorgement of the right auricle, (2) adherent pericardium, and (3) relative weakness, congenital or acquired, of the walls of the veins is considered the most likely explanation in this case. Finally, it is pointed out that such pulsation need not necessarily affect the immediate prognosis.

My thanks are especially due to Dr. Lewis Smith for permission to publish this case, and for his valued help and advice. Prof. H. M. Turnbull allowed me to consult the records of his department in this connexion. To Dr. John Parkinson I am greatly indebted for the cardiogram, and for suggestions and help.

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# Clinical and Laboratory Notes.

## A CASE OF SPIROCHÆTOSIS ICTEROHÆMORRHAGICA.

BY A. COWAN GUTHRIE, M.B., C.M. EDIN.

Spirochætosis icterohæmorrhagica is a rare disease in England, although several cases have been described recently from Norfolk.[1] Owing to its rarity I venture to give a somewhat detailed account of the history, various phases, and progress of this affection as it occurred in a patient whom I attended.

*History.*—On April 23rd, 1925, I was first called to see the invalid, a single lady in early middle age. She informed me that she had just returned from a visit to Egypt and that towards the end of her stay there she had begun to suffer from general malaise. Her health did not improve during the homeward journey and in addition a tendency to sickness began to supervene. On her arrival in England she still felt rather weak and out of sorts although not seriously ill.

*Examination.*—The patient was lying in bed looking apathetic and somnolent, the pulse 76, temperature 98·6° F., the tongue coated with a yellowish-white fur. On abdominal examination no splenic enlargement could be detected, or tenderness in the region of the gall-bladder; hepatic dullness was only slightly increased. In the somewhat poor light of the room the skin generally showed a yellowish tinge, which took on a deeper hue in the conjunctiva. The usual remedies for such a condition were prescribed—a mild saline in the morning, a mixture of bismuth and bicarbonate of soda before food, a euonymin pill at night, and a milk diet.

As, however, the patient's condition did not improve I was called to see her again on April 27th. The jaundice was now apparent, and she complained of sickness. On re-examination no tenderness over the gall-bladder or over any part of the abdomen could be detected.

The urine on examination showed a few leucocytes and numerous epithelial cells of vesical and renal origin (pelvis and calyces), all bile-stained. No tube casts were present. Chemical examination showed a trace of albumin, no blood, a positive reaction for bile 1 per cent., and also the presence of indican. Examination of the blood showed hæmoglobin deficiency. There was variability of the red cells in size and shape, many cells appearing frayed, and there was variability also in their staining qualities, although there was no basophilic degeneration. No spirochætes were found, or evidence of protozoal infection in either the red or white cells. The differential count of the white cells presented fairly normal features, the leucocytes showing variable staining qualities as well as evidence of degenerative changes by the presence of fatty granules. The Widal test was negative.

Up to this time the case was considered one of simple catarrhal jaundice, which had resisted the usual methods of treatment. In order to determine whether or not there was obstruction van den Bergh's test was utilised, the result being indirect reaction positive with negative direct reaction, indicating toxic jaundice, including catarrhal.

On April 28th the patient seemed somewhat better and the slight improvement was maintained throughout the next day till late in the evening, when there was a recurrence of the sickness, the vomit being dark in colour. This condition slightly improved during the next 24 hours.

When I called on the morning of May 1st the patient looked very ill, the pulse was feeble, the temperature subnormal, and there was occasional retching and vomiting of dark coffee-ground material. The next day the patient's condition appeared critical and she tended to lapse into a semi-comatose condition. Colon irrigations of a mixture containing sodium bicarbonate and citrate were administered and this mixture also was given orally with no beneficial effect. It became apparent that the patient was suffering from profound toxæmic jaundice and symptoms of bronchial catarrh now appeared.

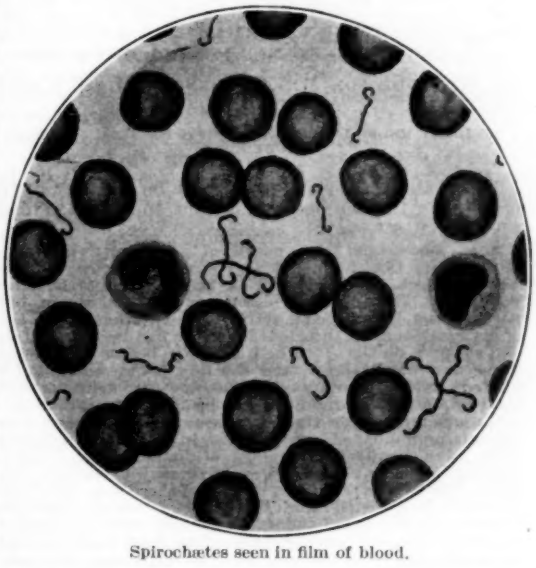
On examination of the blood collected on May 1st spirochætes were discovered for the first time, and in enormous numbers; they were present also, though to a lesser extent, in the urine collected on the same date. Immune horse serum was given intramuscularly with no beneficial result. Lumbar puncture was performed to obtain cerebro-spinal fluid and on examination this showed no excess of either albumin, globulin, or chlorides. It contained 4·1 lymphocytes per c.mm. and no spirochætes were seen in the deposit. The Wassermann reaction gave a clear negative result.

[1] Brit. Med. Jour. 1926, ii., 108.

On May 3rd the patient was in a very collapsed state and only semi-conscious; intravenous saline injections containing sodium bicarbonate were given, adrenalin was also administered, but the patient gradually sank and died the following day. A blood film taken two days before death showed hæmoglobin deficiency; the red cells showed alteration in shape and size; polychromasia was exhibited, although no basophilic degeneration was noticed; platelets were few. The white cells showed vacuolation and fraying of the nuclear material.

*Discussion.*

It is to be remarked that the symptoms shown in this case were not quite classical. At no time was there any great rise of temperature, 99° being the highest, and in point of fact the temperature was subnormal. The patient had the usual slow pulse



Spirochætes seen in film of blood.

and the symptoms gradually deepened from a catarrhal to a grave toxæmic type of jaundice. There was no glandular swelling, but hæmatemesis with semicoma were the salient features of the last phase. It is somewhat important to observe that even at an early stage there was variability in the size, shape, and staining qualities of the red cells, that many cells appeared frayed, and hæmoglobin was deficient. The leucocytes also showed variable staining qualities as well as evidence of degenerative changes.

It is well known that rats are carriers of this disease, their urine, teeming with spirochætes, can contaminate food and drink, and that this is the usual source of infection for human beings. It was noted that there were rats in the ships in which the patient made the journey to England.

Authorities state that the spirochætes may be observed in the peripheral blood till the fifth or even the seventh day by dark-ground illumination. By inoculation of the patient's blood (till the seventh day) into a guinea-pig the animal develops albuminuria and jaundice, and the spirochætes will be found in its liver and blood. After the seventh day the spirochætes are entirely absent from the blood, passing into the internal organs; between the ninth and fifteenth day they may be seen in the urine. Before death, however, in this case they appeared in the blood and also in the urine.

A reproduction of a drawing is given to show the disposition of the spirochætes as they appeared in the film of the patient's blood.

I have not entered into details of all the therapeutic measures adopted during the illness, which varied from time to time as the patient's condition demanded and included a strict diet of milk, citrated and otherwise, fruit juice, and bland fluids; irrigations

containing a mixture of sodium bicarbonate and citrate; rectal injections of dextrose and starch; also injections of adrenalin and strychnine, inhalation of oxygen, &c.

*Conclusions.*

It appears to me that in all cases of jaundice, however mild, examination of the blood for spirochætes should be a routine measure. Should they not be found the blood cells should be examined for degenerative changes, and if these be present, then the agglutination test with stock spirochætes should be performed at once; if this is found positive the antiserum for this disease should be injected without delay. This treatment has been found wonderfully effective in the early stages of the disease.

## A CASE OF MENINGITIS

### DUE TO THE TUBERCLE BACILLUS AND A DIPLOCOCCUS CLOSELY ALLIED TO MICROCOCCUS TETRAGENES.

BY J. TODESCO, M.D. FLORENCE, M.R.C.S. ENG., D.P.H.,

RESIDENT MEDICAL SUPERINTENDENT, BOROUGH HOSPITAL, CROYDON.

THE following case is of interest on account of the findings in the cerebro-spinal fluid and the condition revealed at autopsy.

S. M., a boy, aged 2, was admitted to the Croydon Borough Hospital on Oct. 24th, 1926. He had previously suffered from measles, and, one month ago, from diarrhœa and vomiting. There was a history of tuberculosis in both parents, the disease being active in the mother at the time of his admission. A fortnight before he had become irritable and sleepy; on Oct. 16th he was put to bed as he appeared worse and was feverish, and the day before admission he started having convulsions and became delirious with head retraction and rigidity of limbs and neck.

*On admission* the child appeared semi-conscious, was flushed, and moaned constantly. In addition to rigidity there were frequent twitchings of limbs. The abdomen was not tender or wasted; *tache cérébrale* was marked. The heart sounds were rapid and weak and there were some râles over both lungs, with rapid, though not laboured, breathing. The pupils were dilated and fixed and there was some bilateral conjunctivitis and photophobia. The right knee-jerk was increased, the left absent, and Kernig's and Babinski's signs were markedly positive on both sides. He had constipation and some difficulty of swallowing. Temperature 100·8° F. on admission. On lumbar puncture the cerebro-spinal fluid was slightly turbid, but not under pressure. On examination it contained a few lymphocytes and broken down polymorphs and a Gram-positive diplococcus, some in tetrad formation. There was excess of fibrin in fluid.

Lumbar puncture was repeated on Oct. 25th, 26th, 27th, and 28th, amounts varying between 25 c.cm. and 30 c.cm. being withdrawn. On two occasions there was increased pressure, and on the 28th the fluid withdrawn was clear. The Gram-positive diplococcus was present on each occasion and it was also recovered from the blood on culture. Tubercle bacilli were not at first found in the cerebro-spinal fluid, but were present in the fluid withdrawn on Oct. 26th.

After the first lumbar puncture the child was quieter and there was less rigidity and head retraction. He had profuse general sweating at times. He appeared to improve slightly until Oct. 28th when he became less conscious, the rigidity increased, and there were also twitchings of limbs and teeth-grinding. Cheyne Stokes breathing was now observed and greater difficulty of swallowing. In addition there was retention of urine and diarrhœa. His condition grew steadily worse and he died on Oct. 29th in coma. The temperature kept persistently high throughout, being between 100° and 105° and reaching above 104° on two occasions. The pulse was always rapid and weak and could not be counted at times, and the respiration rate varied from 44 to 70.

*Post-mortem Findings.*—Brain: Excess of cerebro-spinal fluid in ventricles. Extensive gelatinous yellow infiltration of membranes along whole of under surface extending along fissures of brain. On the vertex the whole of the right cerebral hemisphere was dotted with small yellow abscesses, but none were present over left hemisphere. Petrous bones were healthy. Thorax: A few caseating glands along bronchi; no free fluid in pleural cavities. Both lungs partially collapsed and studded throughout with miliary tubercles; no consolidation present; diaphragm normal. Pericardium contained about 1 oz. of clear yellow fluid; heart appeared normal. Abdomen: No free fluid or enlarged glands found anywhere. The intestines were normal, the liver slightly enlarged, and the spleen contained miliary tubercles throughout. Both kidneys showed some cloudy swelling, but no tubercles.

Cultures were taken from the right hemisphere, spleen, lungs, and pericardial fluid, and in each case a diplococcus similar to that present in the cerebro-spinal fluid was recovered.

The following were the cultural characters of the organism isolated from cerebro-spinal fluid and blood (intra-vitam) and organs: (*a*) On agar slope after 24 hours' incubation: thin porcelain-like smooth growth with crenated margin. (*b*) On gelatine stab after 24 hours incubation: fine white growth, no gas, some liquefaction. (*c*) Sugars: lactose, no change; glucose, acid; milk, alkaline. (*d*) Staining: The organism was Gram-positive and was a diplococcus, arranged in pairs, also in tetrad formation. It appeared to be closely allied to the *Micrococcus tetragenes*, but in cultural characters resembled the *M. liquefaciens* rather than *tetragenes*. (*e*) The organism had no effect on two mice given 0·25 c.cm. and 0·5 c.cm. of a broth culture, thus differing from the *M. tetragenes*, which is pathogenic to mice causing a septicæmia.

*Discussion.*

The points of interest in this case appear to be: (1) The character of the cerebro-spinal fluid, which in addition to containing tubercle bacilli, contained a diplococcus and was turbid instead of clear as is usual in tuberculous meningitis. (2) The cultural characters of the organism, which, though on microscopical examination it appeared like a true *Micrococcus tetragenes*, differed from it on culture and in being non-pathogenic to mice. (3) The post-mortem findings. The lesions of the right cerebral hemisphere were not suggestive of tubercle and, moreover, the diplococcus was recovered on culture from this organ, the spleen, lungs, and pericardial fluid.

It appears that the child died from a mixed septicæmia due both to the tubercle bacillus and to a diplococcus recovered from the cerebro-spinal fluid, blood, and various organs. Though *M. tetragenes*, which the organism closely resembles, is found in suppurative lesions and in the respiratory tract in man, it does not usually cause a septicæmia in human beings.

I wish to thank Dr. H. P. Newsholme, medical officer of health for Croydon, for permission to publish this case, and Prof. J. C. Ledingham, F.R.S., of the Lister Institute, for his help and confirmation of the bacteriological findings, and for applying inoculation tests.

ROYAL MEDICAL BENEVOLENT FUND.—The hon. treasurer of the Fund gratefully acknowledges the sum of £30 from Dr. (Phil.) Otto Rank of Vienna, per Dr. Marie Moralt.

At the last meeting of the Committee 44 cases were considered and £769 13*s.* 6*d.* voted to 40 applicants. The following is a summary of some of the cases relieved:—

Widow, aged 65, of L.R.C.P. Edin. who practised in London and died in 1919. Applicant has worked as a deaconess for years until August last, when she had to give up on account of leg trouble. Total income £90 per annum. Rent 11*s.* a week. Voted £26 in 12 monthly instalments.

Widow, aged 45, of M.R.C.S. who died in November. Left with girl of 14 and boy of 12. No private income and only £100 from Insurance. Has had £150 from mother-in-law but it is uncertain whether this will be continued. Now lives in three rooms at a rental of 12*s.* a week. Voted £20.

Widow, aged 53, of M.D. who died in December last. Left with six children ages 11 to 21. Only the eldest one earning. One son studying for the law. Others at school. Voted £30.

M.D., aged 83. Married; one daughter aged 40. Owing to financial losses had to take up practice again. Receipts do not meet expenses. £200 only received this year. Private income £100. Rent £117. Voted £40 in 12 monthly instalments.

Daughter, aged 68, of M.R.C.S. who died in 1881. Owing to bad health is unable to earn much. Only made £6 by fancy-work. £30 per annum from Yorkshire Medical Society. Few small gifts from friends. Rent paid by a friend. Voted £26 in 12 monthly instalments.

M.R.C.S., aged 73, married, three children. Has had to give up work on account of old age and deafness. Wife has a post in a school. Children are unable to help in any way. Applicant has just lost an allowance of 10*s.* a week through death of a sister. Has the old age pension. Voted £40 in 12 monthly instalments.

L.R.C.P. Edin., aged 47, married, one daughter. Receives £300 a year as an assistant. Was taken ill and had an operation for appendicitis. Now only able to do light duty and has to pay locum to do night work. Asks the Fund to help with extra expenses connected with his illness. Voted £35.

Subscriptions may be sent to the Honorary Treasurer, Sir Charters Symonds, at 11, Chandos-street, Cavendish-square, London, W. 1.

# Medical Societies.

## ROYAL SOCIETY OF MEDICINE.

### COMBINED MEETING OF THE SECTIONS OF TROPICAL DISEASES, DERMATOLOGY, AND THERAPEUTICS.

#### THE TREATMENT OF LEPROSY.

AT the combined meeting held on Feb. 2nd a discussion took place on the treatment of leprosy. Prof. R. T. LEIPER, F.R.S., President of the Section of Tropical Diseases, took the chair.

Dr. J. M. H. MACLEOD said that conditions obtaining in the St. Giles's Homes for British Lepers gave an excellent opportunity of appreciating the value of different forms of treatment, especially as the patients, many of whom were well educated, were able to coöperate in efforts on their behalf. Outstanding figures in the advances which had been made since 1909 were Rogers and Muir (Calcutta), Power, Dean, and Macdonald (Hawaii), and Denny and Brill (Philippines). The tendency to remission of the disease made it necessary that any remedy should have a prolonged trial before being approved. It was difficult to say that a case of leprosy was cured, as even after years of apparent freedom from the bacilli recurrence was liable to take place. It was now generally recognised that the disease tended to be self-curative, but the process involved long years of suffering which left many mutilations.

Treatment might be either general, local, or specific. It was impossible to exaggerate the importance of placing the patient under the best hygienic conditions with ample good food and a cheerful environment. The patients seemed to do best in high dry altitudes; summer usually brought improvement and winter relapses. Local treatment was palliative and symptomatic and had but little influence on the general course; freezing of isolated nodules with carbon dioxide should not be done without great caution. Specific treatment included the use of (1) metallic preparations, (2) sera and vaccines, and (3) certain oils and their derivatives. Little could be said for arsenic and mercury (either perchloride or sozoiodolate), but benefit had been attributed to intramuscular injection of tartar emetic or colloidal antimony, the latter being preferable because it caused little irritation and had practically no toxic effect. Iodide of potassium had also been employed, either alone or with chaulmoogra oil, and had brought about flattening of nodules and healing of ulcers. Sera had not so far been of value in the disease. Koch's tuberculin produced a strong reaction in leprous patients. In some cases this was followed by temporary improvement, but in others by intensification of the disease, and its use had the additional risk that it might light up latent tuberculous foci, since leprous patients frequently had both diseases. Benefit had been claimed from the use of non-specific vaccines prepared from *B. typhosus*, staphylococcus, and *B. pyocyaneus*, which produced a reaction, but similar effects followed the injection of milk-albumin. It was the general experience that patients benefited by the use of vegetable oils and their derivatives in direct proportion to the quantity tolerated. Sir Leonard Rogers had shown that unpleasant drawbacks due to the oil could be obviated by substituting either salts or esters of their fatty acids, these being given by injection. Dr. MacLeod still preserved an open mind about the specific action of these remedies.

Dr. ERNEST MUIR (Calcutta) contributed a paper, which was read by Sir LEONARD ROGERS, F.R.S. Dr. Muir agreed that there was not yet any real specific for leprosy, but submitted that by following a certain line of treatment all active signs of the disease could be made to disappear permanently in early cases, though there was liability to relapse if the general health was markedly lowered. In Calcutta treatment was being carried out on the following general lines: (1) treatment of any accompanying physical or mental disease; (2) rectification of diet; (3) exercises, gradually increased in extent; and (4) use of special drugs, chiefly hydnocarpus oil and its preparations. The routine, he said, was to begin with injections of hydnocarpus oil with 4 per cent. creosote, either intramuscularly or by infiltration under the skin of extensor surfaces. These injections were given twice weekly, beginning with 4 c.cm. and gradually rising to 10 c.cm. When the latter dose was well tolerated a solution of sodium hydnocarpate in saline (1 per cent.) was given intravenously twice a week, beginning with 2 or 4 c.cm. and rising to 10 c.cm. This treatment was continued until reaction followed or the veins became blocked; in either event infiltration with oil was resumed. In the second stage of the disease care must be taken to avoid untoward results, only small injections being given until the patient had been brought into a good general state. In the third stage treatment could be pressed without fear.

Three classes of agents broke down lepra cells: (*a*) acute fevers (malaria, kala-azar), streptococcal and staphylococcal infections; (*b*) anything which produced protein shock; (*c*) the injection of irritating substances. Vaccines, especially when used intravenously, were very useful in the third stage of leprosy. Treatment should be persisted in for from six months to two years after all active signs of the disease had been absent.

Dr. H. W. WADE and Dr. C. B. LARA (Culion Leper Colony, Philippines) sent a contribution which was read by Sir Leonard Rogers. They said that the antileprosy campaign in the Philippines at the present time was a three-phase one in which both treatment and segregation played leading rôles. The chief medicament employed by them was chaulmoogra ethyl esters, usually with iodine added to reduce irritation. Weekly intramuscular injections were used almost invariably. At the San Lazaro Hospital in the five years 1921–25 a total of 250 bacteriologically positive cases had become negative. This was largely a collecting-station and could not accommodate all the patients who were eligible to stay. In the Cebu detention camp (where treatment was even less than at San Lazaro) there was a large turnover of cases. At the Culion colony new work was started in 1921 with 500 cases, and by early in the following year 1000 cases were under treatment—almost exclusively by ethyl esters—while by the end of that year the cases that had been for a time under treatment totalled 4458, the average duration of the disease in these being about eight years. Up to Nov. 1st last 358 patients had been discharged or paroled, 27 had died while in the negative period, and on that date 244 negatives were under observation. Of the 358 cases that had now been sent out only four had returned to Culion and three out of 245 paroled. For work on a large scale the modern treatment was decidedly superior to the older, especially in early cases.

Dr. ISABEL KERR (Dichpalli Leper Institution, India) sent a paper of which the substance was given by Sir Leonard Rogers. At this institution treatment began with the ethyl ester of the fatty acids of hydnocarpus oil combined with creosote, camphor, and olive oil, these being given subcutaneously or intramuscularly. Following this treatment insensitive patches improved, nodules disappeared, and the patient's condition markedly improved. Later the pure ester was given, combined with iodine intravenously and intramuscularly; in this way as much as 16 c.cm. of ester was given to some patients in a week and the early cases which could tolerate such a dosage did well. Acute skin cases rarely took the full dosage. Sixty-six per cent. of cases were very much improved, while 12 per cent. had become symptom-free. They felt that, in early cases, they could depend on a large percentage of successes; in the second stage only small doses must be given

owing to the danger of aggravating the disease; in the third stage the drug could be pushed.

Dr. J. H. SEQUEIRA referred to the case of a patient with advanced maculo-anæsthetic leprosy, a European, aged 44, who was given an injection of 100 c.cm. of a sterile saline solution. Within half an hour of the injection he had rigors and the temperature rose to 100° F. A few days later he was given a similar injection, and it was again followed by a rigor and the temperature was 101°. After this second injection the leprous eruption began to fade. A third similar injection resulted in a rigor and a temperature of 100·4°. Thereafter the lesions had disappeared and during the following 16 years had not recurred.

Dr. G. PERNET said that he had found that the best treatment of leprosy in the nodular form was chaulmoogra oil, but it must not be looked upon as in any sense a specific. Those who undertook treatment of this disease must remember how remarkably the bacilli were generalised throughout the body. He emphasised the importance of hygiene, good food, and fresh air, and suggested the use of thyroid extract because it increased general metabolism.

Dr. G. C. LOW agreed there was not yet available any specific cure for leprosy, but urged that the work being done on the subject, apparently with a considerable measure of success, should be persisted in.

Mr. T. A. HENRY, D.Sc. (Wellcome Chemical Research Laboratories) said that it was thought by chemists that the beneficial action of chaulmoogra and hydnocarpus oils in leprosy was due to chaulmoogric acid and hydnocarpic acid, which were now being administered in the form of sodium salts, ethyl esters, or carefully refined natural oils. Sir Leonard Rogers had pointed out that in order to be useful the acids must be employed in the liquid state, or nearly so, at the body temperature. A mixture of the two acids gave the best results, and American workers had been so impressed with this fact that they were importing the seeds of the various trees for cultivation in their own country. Research had shown that mercury, gold, and copper compounds appeared occasionally to exert a favourable influence on both tuberculosis and leprosy. Most hope seemed to centre round the mercury derivatives.

Dr. ROBERT COCHRANE spoke of his experiences in connexion with the Mission to Lepers. He remarked that hydnocarpus oil with 4 per cent. creosote was now the cheapest of the remedies.

Dr. E. A. O. TRAVERS gave an account of his work as physician at the Qualalumpore establishment in the Federated Malay States. There the main treatment was by the powdered whole nut of the hydnocarpus. Of his cases 81 per cent. were improved and 11·5 per cent. became negative under the treatment, while the improvement in the general health of most of the patients was remarkable. The remedy was taken by the mouth twice daily, and was popular. Injections were given in addition when a case did not seem to respond well.

Dr. JAMES HASSON said he had found chaulmoogra disappointing, but most of his cases had the disease in an advanced form. He did not agree that the results of treatment by vaccines were due to protein shock; he thought that the action of vaccines was specific.

Dr. F. HALL spoke of his work of ten years at Fiji Leper Asylum. The tendency of leprosy, he said, was towards cure if cases came under care and were given the best conditions early. Intercurrent diseases must be carefully treated in every case.

Sir LEONARD ROGERS said that though a 3 per cent. solution of sodium salts of the oils caused irritation in some patients, it did not do so in all, and he had found that a small vein would stand six injections of a 1 per cent. solution without pain, and that here was no precipitation in the vein. The cost was five doses for a penny. Moreover, the 1 per cent. solution was as beneficial as the 3 per cent. Recent researches showed that the situation was now much more hopeful. Leprosy was largely a question of house infection and means were at hand to reduce the disease to very small dimensions in two or three decades. In South Africa early sufferers were seeking to enter the sanatoria—a welcome change in the public point of view. He concluded by paying a warm tribute to the work being done in this matter by the Americans.

## MEDICAL SOCIETY OF LONDON.

AT a meeting of this Society held on Feb. 7th, Sir HUMPHRY ROLLESTON, the President, in the chair, Dr. F. M. R. WALSHE opened a discussion on

### POLIOMYELITIS.

His paper appears in full on p. 326 of this issue.

Prof. JAMES MCINTOSH gave a summary of the experimental work which had been done on the ætiology and pathology of the disease. Acute anterior poliomyelitis, he said, was now a very clearly defined disease at the stage at which the paralytic symptoms had developed. Knowledge of its pathology was comparatively recent. It had been placed on a sound basis by the monographs of Harbitz and Vickman (in connexion with the Swedish epidemics) and by Müller, Lansteiner, Levaditi, and others. In post-mortem examinations of acute cases of the disease evidence was found of a toxæmia; mild degeneration of internal organs was found, and general enlargement of lymphatic glands, including those of the intestinal canal. In the central nervous system, and especially in the cord, there were minute hæmorrhages and congestion of the grey matter. Lesions of the central nervous system were practically confined to the grey matter of the cord; only rarely were there marked lesions in the cortex. There was definite involvement of the pia-arachnoid, particularly of the perivascular type—i.e., in the perivascular lymphatic sheath of the blood-vessels of the cord. The pia-arachnoid was found to be densely packed with cells. In the anterior horn of the grey matter of the cord there was an intense inflammatory reaction, with minute hæmorrhages and destruction of the ganglion-cells. Later these were removed by the phagocytic cells. The main cells found were lymphocytes, but there was also a small number of the larger endothelial leucocytes, and some polynuclear leucocytes, and sometimes plasma-cells. The chief lesion of the cord was a degeneration of ganglion-cells, followed later by complete disappearance of the cells—hence the anæsthesia and the complete paralysis which developed. Softening of the cord occurred only in rare cases. Histological findings confirmed the conclusion arrived at earlier on clinical grounds that this disease was an acute infection.

In 1909 Lansteiner and Kocher, working in Vienna, had succeeded, for the first time, in transmitting the disease to monkeys; they took the spinal cord from a fatal case of the disease, ossified it in saline, and injected it into two monkeys by the intracerebral route, following a trephine opening; 1 c.cm. of the fluid was injected and the monkeys developed the disease 16 to 18 days respectively after the injection, and had paralysis of the lower limbs. One of them died of the disease, and the lesion found in its cord was absolutely identical with that found in human cases. Confirmation of this had since come from practically every civilised country. In 1912 and 1918 Prof. H. M. Turnbull and the speaker had successfully done the same inoculation. It was not so easy to transmit the disease to rabbits.

#### *The Incubation Period and the Virus.*

It was always difficult to work out incubation periods of human infections, but work on monkeys showed an incubation period varying between 4 and 17 days; it worked out in a number of cases at 9 to 10 days. In the Swedish epidemic the period was 14 to 16 days. The monkey when given the disease showed prodromal symptoms, was out of sorts, and lost relish for food; it had tremor of limbs and the

temperature was raised. In from 24 to 48 hours paralyses suddenly supervened, commencing usually in the lower limbs and thence extending upwards. In the monkey, in most instances, the disease was fatal. In a few it was mild and transient and recovery was quick. Investigations on monkeys showed that the responsible virus was a filter-passer; it could even pass through some of the coarser porcelain filters. For that reason it had not yet been cultivated. The research revealed the curious fact that the virus had some extraordinary powers of resistance. An infected cord could be completely dried over caustic soda and yet would remain virulent for 24 days; it could be kept in ice indefinitely, or frozen, without its virulence being thereby diminished. Even a 50 per cent. dilution of glycerine had no lethal effect on the virus which also showed a special resistance to antiseptics; apparently 5 per cent. carbolic had no effect on it. On the other hand, it was very susceptible to a 1 in 1000 solution of potassium permanganate, which killed it at once. Hydrogen peroxide was in the same category. This was important as it affected prophylactic measures directed to the nasopharynx. The question of the distribution of the virus in the body had been worked at chiefly by inoculating monkeys with the organs of monkeys which had the disease or with the organs of human beings who had died of the disease. In the monkey disease, wherever the inoculation was made—brain, peritoneum, skin, nerve—the result and the succession of symptoms was the same, being chiefly due to a cord lesion. This demonstrated an extraordinarily selective action on the spinal cord. The blood very rarely contained the virus, nor did the spleen, liver, or kidneys. It had been discovered only in the central nervous system and the lymphatic system.

*Mode of Spread.*

Vickman had attributed one outbreak in Sweden to contamination by milk, continued Prof. McIntosh, and many patients suffered from gastro-intestinal disorder. It was not, however, easy to give the disease to monkeys by infecting their food. The common portal of entry of the virus seemed to be the nasopharynx. Plugging the nasal cavity of the animals with infected material sometimes succeeded, but it was evident that the mucous membrane there offered some resistance. This was generally overcome by abrading its surface. The spread of the disease by excretions and secretions had also been investigated. Vickman, in 1905, had brought forward evidence of its spread by means of carriers, also by drawings and books. There had not yet been any satisfactory evidence that bites of insects played any part in disseminating the disease. It seemed to be mainly spread by direct contact—i.e., by contamination by the saliva and by coughing. The nasopharyngeal mucus had been shown by Kling to contain the virus for many weeks after an attack of the disease. Patients who had recovered from one attack remained immune for the rest of their lives; monkeys which had recovered from an attack, even if abortive, could not again be inoculated with the disease, and their serum was found to have antibacterial properties. This had been the basis of attempted serum therapy, and good results were claimed for such treatment in France and America. The quick onset of the disease was, however, a practical difficulty. Experimental attempts had been made to immunise monkeys by vaccination, either by means of a killed virus or an attenuated living one, and there had been some success. As regards general measures of prophylaxis every effort should be made to keep the nasopharynx as free as possible from infection. As the virus remained in the throat for some time after the disease had apparently subsided, cases should be isolated for about three weeks. Estimates of the prophylactic value of serum must rest on future experiment. In the face of a big epidemic the speaker did not see why attempts to vaccinate with the killed virus should not be made. He concluded by pointing out possible diagnostic errors, especially in regard to progressive muscular atrophy of the infantile type, Landry's paralysis, and forms of toxic neuritis.

*Discussion.*

Sir THOMAS HORDER said that Dr. Mervyn Gordon, whom illness prevented from being present, had sent him a communication in which he said that the characteristic lesions in poliomyelitis were two—the condition termed neuronolysis and that named neuronophagia. Thus there were the perivascular infiltrative lesions, which were not so peculiar to this disease, and the more purely nervous specific lesions involving the cells of the grey matter.

Sir Thomas Horder then spoke of the differential diagnosis of poliomyelitis from other acute infections which had little or no specific effect on the central nervous system. He said that pneumonia, and especially the broncho-pneumonia of children, might resemble poliomyelitis when the subarachnoid was involved, and that in any case the possibility of encephalitis and infective polyneuritis must also be carefully borne in mind. Three times he had seen retention of urine as the first symptom in poliomyelitis, all three patients being young adults. Focal pains at the onset of the illness were significant, and should arouse suspicion. Generalised and especially local or focal tenderness and sensory disturbance he placed in the same category. Hexamine in full doses at the earliest possible moment seemed a likely mode of treatment; he had also given salicylate of soda intravenously morning and evening for three to six days. In this disease the virus was a filter-passer, and he suggested there was an affinity between groups of infecting agents and drugs. He had also given, as early as possible, collosol iodine intravenously.

Dr. JAMES COLLIER said that the finding of the virus in the mouth of a person 17 days after an attack did not mean that that person was capable of infecting a fresh patient with the disease. He related a number of facts which had strengthened his belief that this was a disease which was disseminated by non-suffering carrier cases.

Dr. A. F. HURST dealt with the administration of hexamine in the disease. He believed that the reason it had not given uniformly good results was that the doses given were not large enough; 10 even 20 gr. thrice daily was not nearly enough. If 60 gr. each of potassium citrate and sodium bicarbonate were given at the same time, 100 gr. of hexamine could safely be given thrice daily without any anxiety about the urine. He had not carried out this treatment in poliomyelitis, but he had in encephalitis, and it was easily borne by the patients.

Dr. H. M. RAVEN spoke as a patient who had recovered from the disease, and gave an account of the Broadstairs visitation of poliomyelitis. There had been two or three cases at each of several schools, but half the epidemic had been in separate houses. From his observations and experience he could not consent to the idea that dust and flies could be left out of the agencies of spread. During the epidemic he had found constipation very rife as well as some cases of suppression of urine. He reminded members that macerated flies had been proved to be capable of infecting monkeys.

Mr. R. C. ELMSLIE said that 30 per cent. or more of the cases of past poliomyelitis which he saw as a surgeon had not been correctly diagnosed when they had the acute disease. The brief febrile condition was apt to be unnoticed in little children. A large number of cases were not part of epidemics, but isolated cases. Often the diagnosis had to be made from some form of arthritis of the hip-joint. Two or three years ago he with others had interested himself in the matter and had got the London County Council to agree to set aside a certain number of beds for segregating cases of poliomyelitis, but the purpose had been largely spoiled by the decision that to these reserved beds no case could be admitted until three months had elapsed since the onset of the disease.

Dr. WALSHE and Prof. MCINTOSH very briefly replied.

## LIVERPOOL MEDICAL INSTITUTION.

A MEETING of this Institution was held on Jan. 13th, when Prof. D. P. D. WILKIE read a paper on the

*Place of Surgery in Treatment of Diseases Associated with Enlargement of the Spleen.*

Until quite recent times, he said, the interest of surgeons in the spleen had centred mainly in the operative treatment of traumatic rupture of the organ and in the rare cases of torsion of a wandering spleen. Increasing knowledge of its functions, and thus of the rôle which the spleen possibly played in diseases in which it was manifestly enlarged, had encouraged attempts to remove it in cases of splenomegaly. A phase of what was, in fact, experimental surgery had then set in, and the effect of splenectomy on the course of diseases associated with splenomegaly had been studied intensively.

The treatment of these diseases should involve constant and intimate coöperation between the physician and the surgeon. In cases of septic infarct of the spleen surgical interference was practically never necessary, the special surgical interest of these cases lying in the likelihood of their being mistaken for a perforation needing immediate operation. In cases of splenic tuberculosis the question of splenectomy should be thoroughly discussed, for it had been found that in certain cases removal of the organ had led to a favourable termination of a long febrile illness. With regard to syphilis, Mayo had first drawn attention to the fact that the spleen might be the fastness in which the spirochæte could lodge and defy all specific drug treatment, and had shown that splenectomy would permit of rapid cure by medicinal means. Operation for splenic anæmia or Banti's disease presented two main difficulties. In some cases extensive and dense perisplenic adhesions might hamper removal, so that in freeing the spleen there might be considerable hæmorrhage and shock. The second difficulty lay with the splenic vein, which was friable from endophlebitis and might tear when ligatured. Special care would obviate this complication. When operation was performed in the late stage of the disease in the presence of hepatic cirrhosis and ascites the combination of omentopexy with splenectomy, as advised by Tansini, appeared rational and had been performed with success in a number of cases.

In diseases of the blood associated with splenomegaly, went on Prof. Wilkie, pride of place should be given to hæmolytic jaundice, for of all the blood dyscrasias with splenic enlargement it was most often successfully treated by splenectomy. The relief following operation in this condition was so dramatic as to be almost unbelievable. There was only one treatment for hæmolytic jaundice and that was splenectomy. It presented no special difficulties in this disease, and extirpation of the organ which was responsible for breaking up and destroying the fragile red cells was immediately followed by the disappearance of all signs and symptoms of the disease.

After discussing other conditions in which the spleen was enlarged, Prof. Wilkie concluded by stating that splenectomy had now an established place in the treatment of acquired hæmolytic jaundice, chronic purpura, splenic anæmia, and Gaucher's disease. In certain other diseases it might be carried out with benefit in a few selected cases—namely, in splenomedullary leukæmia, pernicious anæmia, Jaksch's disease, and tuberculous and syphilitic splenomegaly. In a third group of diseases, such as malaria, polycythæmia vera, and the acute leukæmias, the operation was not indicated.

Dr. S. W. PATTERSON read a paper dealing especially with the medical aspects of the subject. By radiography, he said, the spleen could be demonstrated (*a*) directly, and also (*b*) indirectly by the deformity of the greater curvature of the stomach or splenic fixture of the colon when these organs were distended with opaque material. He agreed that in cases of acholuric jaundice splenectomy was the treatment of choice, and illustrated the familiar type of these diseases by describing a family of 29 members. Of this family, 17 members were affected and eight of them had had the spleen removed. The operation had brought about immediate relief of the jaundice and lessening of the anæmia, but the fragility of the red blood corpuscles was apparently unaltered, and in one case it was present 18 years after splenectomy. In pernicious anæmia the results of splenectomy were not good, but in purpura depending on a dyscrasia of the blood platelets the operation gave satisfactory results. He emphasised the good results of X ray treatment of spleen and long bones in leukæmia, and concluded by saying that, although the spleen was far from being a superfluous organ, the normal spleen could be removed without seriously injuring health. A spleen acting abnormally was a dangerous organ and was better taken away.

## CARDIFF MEDICAL SOCIETY.

AT a meeting of this Society held on Jan. 18th, Dr. ALFRED HOWELL in the chair, Prof. E. H. KETTLE read a paper entitled

*The Story of Experimental Cancer Research.*

The systematic experimental investigation of cancer, he said, dates from the publication of Jensen's papers in 1902-03, in which was announced the successful propagation of a mammary carcinoma of the mouse through many generations. Jensen's tumour was exhaustively studied in this country and on the continent, and very soon other spontaneous tumours in mice and rats were recognised and made available for further study. Much information about the general biology of malignant tumours and the special features of individual examples was gradually accumulated, but it has become recognised that the study of propagated tumours is only of limited value. In any series of inoculations tumours fail to grow in a certain proportion of the animals. Further, some tumours after a period of progressive growth retrogress and finally become completely absorbed, when the mice in which this has occurred become refractory to further inoculations with the same brand of tumour. These observations fitted in well with the current trend of pathological thought, and the investigation of natural and acquired immunity to the inoculated tumour was entered upon with high hopes. Unfortunately, though mice can be rendered immune to inoculation with tumour tissue, no means has been discovered to control the progress of spontaneous tumours.

About this time, when it seemed that experimental cancer research had reached a dead end, it received a welcome stimulus in the work of certain Japanese investigators, who demonstrated the possibility of producing cancer of the skin in animals by exposing them to irritants, especially tar. This line of research has been fruitful in results and has still great possibilities. It has been shown, for example, that as a general rule cancer of the skin can only be produced by the repeated action of the irritant and develops only after a considerable period of time, a period corresponding to some 20 or 30 years in the life of man. At the same time it is not necessary to apply the irritant throughout the whole of this period; a couple of months' application of tar may be followed four months or more afterwards by the development of cancer. Of even greater significance in their bearing on human pathology are certain observations that tend to prove that a local cancer is associated with a definite constitutional change.

After referring to the study of the cancer cell in cultures in vitro, Prof. Kettle briefly dealt with the recent work of Gye and Barnard. He pointed out that all the work of the past showed that, with one exception, malignant growth could only be propagated by the inoculation of the actual living cell. This exception was the sarcoma of fowls described and studied by Peyton Rous, which could be propagated

by a cell-free extract. Gye has demonstrated that this cell-free extract contains two substances, neither of which is capable of producing a tumour when used alone, though in combination they can do so. Gye claims that one of these factors is a non-specific living virus, and on the optical side he is supported by Barnard's work. This work is still very recent, but it has received already a considerable degree of confirmation and is obviously of the first importance. Indeed, its bearing on the general problem of infection may eventually outshadow its application to the more limited pathology of tumours.

## ABERDEEN MEDICO-CHIRURGICAL SOCIETY.

AT a meeting of this Society held on Jan. 13th, Dr. THOMAS FRASER, Vice-President, in the chair, Dr. ROBERT RICHARDS read a note on

*Some Cases of Dysentery in Aberdeen.*

Bacillary dysentery, he said, was classified under three main headings: (1) endemic, occurring in tropical and subtropical countries; (2) epidemic, usually occurring in the minor form in local outbreaks in this country; and (3) sporadic, occurring in strictly isolated cases where the two previous types were rare or unknown. Referring to the work done on infantile diarrhœa and the differences of opinion about the causal organisms, Dr. Richards said that American investigators had found that in a large proportion the *Bacillus dysenteriæ* of Flexner was responsible, the proportion found at the Boston Floating Hospital being 75 per cent. and at Baltimore 80 per cent. The latest figures for Britain were those of D. Nabarro who had found dysentery bacilli in 13 cases out of 150 treated at the Hospital for Sick Children, Great Ormond-street. In the Aberdeen epidemic the first case recorded had been that of a boy aged 7, sent to the Royal Hospital for Sick Children with a diagnosis of intussusception.

He had been ill for two days with vomiting, purging, and fever (101·2° F.) with the passage of large quantities of blood and mucus. On admission he had a pinched, anxious expression; the abdomen was retracted and tender, but no tumour was felt. Rectal examination caused severe tenesmus with the expulsion of some blood and mucus. A tentative diagnosis of ileocolitis or dysentery was made, but in view of the doctor's statement that he had felt a tumour the abdomen was opened. No tumour was found, but the colon was thickened and swollen, and the appendix swollen and congested with great enlargement of the mesenteric glands. The case was then treated as one of acute dysentery, and the condition rapidly cleared up on administration of magnesium sulphate. The finding of *B. dysenteriæ* (Flexner) confirmed the diagnosis.

In this country, said Dr. Richards, the diagnosis of intussusception in such cases was not unlikely, but on rectal examination a distinct difference was to be made out. In dysentery the tenesmus set up was very great, and the examining finger was forcibly ejected, followed by the passage of blood and mucus; in intussusception, on the other hand, the rectum was large and roomy—unless a tumour was felt—and no tenesmus was set up.

The next three cases described were children aged 8, 4, and 5, all of whom showed typical symptoms of dysentery. *B. dysenteriæ* (Flexner) had been isolated in two of the cases; examination of the stool in the remaining case had twice been negative for dysentery organisms, but this might have been due to delay in transmitting the specimen. In the fifth case, that of a child of 4, there had been practically the same symptoms, but the causative organisms had belonged to the food poisoning group, the *Bacillus aertrycke*. An interesting feature of this case was a sequela three years later, when the patient came up complaining of a painful left knee, the pain being evidently referred from the hip-joint where all movements were restricted and a certain degree of fixed flexion was present. The temperature was 100° and the pulse correspondingly rapid. Radiographic examination was negative. On the same afternoon the patient became sick and developed diarrhœa accompanied by tenesmus and the passage of blood and mucus in the stool. A diagnosis of dysentery with toxic arthritis was made and the finding of the Sonne bacillus confirmed this. Further confirmation was afforded by the clearing up of both conditions under treatment with saline aperients. Dr. Richards said that he believed that there was no previous record of such metastatic joint symptoms from Sonne dysentery, although arthritis was a common complication of both Shiga and Flexner dysentery in Macedonia. After describing a further series of three cases of Sonne dysentery, he gave it as his opinion that true dysentery was not so rare amongst the general population as was usually stated. Treatment with magnesium sulphate was found to be almost specific.

## ROYAL ACADEMY OF MEDICINE IN IRELAND.

### SECTION OF MEDICINE.

A MEETING of this Section was held on Jan. 28th, Dr. G. E. NESBITT, the President, in the chair.

Dr. MAURICE DRUMMOND showed three cases of

*Ringworm in Children treated by Epilation with Thallium Acetate.*

The children were aged 6, 4, and 2 years and 5 months The method, said Dr. Drummond, had been used successfully in over 500 cases by Cicero and Peter in ringworm schools in Mexico and in over 100 cases by Buschke and Langer in the Rudolph Virchow Hospital in Berlin. It was essential that one alone of the salts of thallium should be used—the protoxide of the acetate of thallium. He had used that of Kahlbaum. The Germans found that 8 mg. per kg. of body-weight was the most satisfactory dose for children of all ages. Peter in Mexico gave 5 mg. per kg. for children under 5 years of age. In each of the children shown 8 mg. had been administered, and Dr. Drummond had found it only just sufficient in the case of the two younger children. The drug was given in 2 ounces of sweetened water. Rapid and profuse fall of the hair took place on the fifteenth day with the two younger children. The fall had not been so satisfactory with the eldest child. The action of the drug was apparently selective, the eyebrows and fringe on the front of the head being unaffected. As X ray epilation could not be carried out in children under the age of 3, he thought that—apart from its general utility—thallium epilation should be of especial value in young children, as also in epidemics. In the case of the eldest child, who had been epilated in November, the hair was again growing well, and it was beginning to grow in the case of the second child who had been done in December. The youngest child had only just been epilated. The drug was contra-indicated in the presence of albuminuria. In case of partial failure, a further dose must on no account be given within at least two or three months, as the action of the drug was strongly cumulative and symptoms of acute poisoning might develop. Almost meticulous care was necessary in the weighing of the child and of the drug. Dr. Drummond was not yet sure that a slightly higher dose might not be necessary with older children. Constitution, climate, and the freshness of the drug were all factors to be considered.

The PRESIDENT said that the effects of the treatment in the three cases shown were little short of miraculous. He regarded the method as much better than the use of X rays, but of course Dr. Drummond would require a larger experience of it before he could pronounce a final judgment on it.

Dr. E. FREEMAN quoted a series of published cases.

Dr. W. G. HARVEY referred to the original experiments with thallium, which had been carried out by Sabouraud, and which had been quite unsuccessful. Very large doses had been employed, and this, perhaps, had been the cause of the failure, as very serious symptoms had arisen after treatment, including hæmorrhage and purpura. This method now seemed to be of great use, quite apart from whether it would

replace X ray treatment or not. The difficulty of X raying young children, such as Dr. Drummond's patients, was very great.

After further discussion, Dr. Drummond said that Langer in Berlin said that he got the thallium only from one chemist. It was stated that the drug deteriorated with age. If the drug was fresh, the hair would fall out on the fifteenth day after application, but if the drugs were not fresh when applied, the hair might take three weeks to fall out.

Dr. V. M. SYNGE showed specimens from a case of

*Spontaneous Hæmorrhage into the Brain.*

The specimens were from a young man aged 21. On Oct. 14th, 1926, whilst at work he suddenly fell down unconscious. He had previously been perfectly healthy and had received no injury of any sort. When admitted to hospital a few hours later he was still unconscious, the limbs were rigid and flexed, and occasional clonic spasms occurred. The neck was stiff. Pulse rate, 66; temperature, 99° F.; respiration rate, 26. He vomited undigested food several times. A catheter specimen of urine contained a fair amount of albumin. The blood pressure was normal, and the blood urea 65 mg. per 100 c.cm.

During the following days the temperature rose to 104°; the unconsciousness diminished. On Oct. 16th 30 c.cm. of fluid were removed by lumbar puncture. It was under great tension and contained a good deal of blood. There was no improvement after the puncture. The Wassermann reaction of the blood was negative. The patient remained semi-conscious, the neck stiffness increased, Kernig's sign was positive, and the limb was stiff but without paralysis. On Oct. 21st lumbar puncture was again performed, and 35 c.cm. of fluid under tension removed; the report being: a little blood present (fluid otherwise clear) globulin slightly increased, glucose present, no pus, sterile on culture, and no tubercle bacilli present.

A dose of 15 c.cm. of sodium salicylate solution was given intravenously, the high temperature, general condition, Kernig's sign, and character of cerebro-spinal fluid suggesting the probability of encephalitis lethargica. The temperature dropped, the pulse rate fell from 100 to 60, but there was no improvement in the general condition. The fundus of both eyes was normal. The patient got suddenly convulsed, and on Oct. 31st collapsed and died in a few hours.

At *autopsy* there was no sign of any injury. In the anterior horn of the right lateral ventricle there was a mass of clotted blood which had destroyed a large part of the frontal lobe; all the ventricles were full of blood, and there was a mass of effused blood on the base of the brain. The heart, spleen, kidneys, and other organs were normal; there was no sign of arterial disease. Sections failed to show any evidence of a tumour in the brain. Sections of the kidneys were normal.

This apparently quite spontaneous hæmorrhage, said Dr. Synge, had evidently originated in the right frontal lobe, afterwards bursting into the ventricles and thence into the subarachnoid space.

The PRESIDENT said that the case was very interesting, because in so young a patient no one would have thought of making a diagnosis of cerebral hæmorrhage, especially in the absence of the phenomena usually sought for. Therefore the case was an important one. He thought that the cause of spontaneous hæmorrhage was always difficult to ascertain. It was possible to have fairly advanced renal disease with a blood-urea of no more than 65 mg., and he thought that in this case the boy probably had some chronic renal disease. He asked if there was anything in the brain to suggest encephalitis lethargica. He could not remember having seen cerebral hæmorrhage under the age of 29.

Sir JAMES CRAIG said although in this case the blood-urea was greater than normal, still the kidneys were healthy; therefore he did not think that it could be assumed that the hæmorrhage was due to any renal disease.

Dr. SYNGE, in replying, said that on account of the destruction done by the hæmorrhage it had not been possible to examine the artery that had actually ruptured. The small arteries seen under the microscope appeared to be perfectly normal, and he thought that an artery was unlikely to rupture unless the pressure inside it was very great. Nothing abnormal had been found in the kidneys, and there had been no evidence of nephritis at all, except albuminuria, which had been present at first. It had been very difficult, however, to examine the urine as the patient had suffered from persistent incontinence.

# Reviews and Notices of Books.

CÆSAREAN SECTION.

With a Table of 120 Cases. By HERBERT R. SPENCER, M.D., F.R.C.P., Consulting Obstetric Physician to University College Hospital. London: John Bale, Sons and Danielsson. Pp. 74. 6*s*.

Dr. Spencer states that this little book makes no pretence to be a treatise on Cæsarean section, but is a record as frank as he can make it of his own experience of the operation. He asks those who do not agree with his conclusions to publish a complete and detailed record bearing on the points of their disagreement. The publication of a selected series of cases is deprecated, since a proper judgment as to the value of the statistics can only be formed when details are given, and also particulars of the number of craniotomies.

During the last 33 years he has operated on 120 cases, either in hospital or in private, with a maternal mortality and infant mortality-rate of 3·3 per cent. and 10 per cent. respectively. The majority of these cases were derived from University College Hospital Maternity, where during this period over 80,000 labours were conducted. He remarks that the small number of cases is partly due to the fact that at this hospital premature labour is induced three and a half times as often as Cæsarean section is performed for contracted pelvis. A careful analysis is made of all the cases operated upon, full details being set forth in tabular form at the end of the book. Contracted pelvis was an indication for the treatment in 81·6 per cent. of cases, whilst 70 per cent. were not in labour at the time of operation. The classical midline upper uterine segment incision was employed on all occasions, and the author states his reasons for not using the extra-peritoneal and trans-peritoneal cervical operations. The operative technique is discussed in detail, and a strong plea is made for the use of carbolised silk in suturing the uterine incision, the author having abandoned the use of catgut more than 30 years ago.

As to the anæsthetic employed, Dr. Spencer insists on the use of chloroform until the child is delivered, and open ether subsequently. Spinal anæsthesia is condemned, chiefly because the author believes it to be more dangerous than a general anæsthetic. As the latter was given in all but one of his cases, this censure of spinal anæsthesia appears a little unwarranted, particularly as it has been employed by others on many occasions without a fatality. The author also strongly disapproves of sterilisation of the patient after Cæsarean section and denounces this procedure in no uncertain terms. We welcome this record of the personal experiences of a practised surgeon, which is a valuable addition to the literature of obstetrics.

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DIATHERMY.

With Special Reference to Pneumonia. Second edition. By HARRY EATON STEWART, M.D., formerly Attending Specialist in Physiotherapy, U.S. Marine Hospitals, New York; Consultant in Physiotherapy, U.S.V.B. Hospital, New Haven, Conn. New York: Paul B. Hoeber. 1926. Pp. 208. $3.00.

THIS introduction to the medical and surgical uses of diathermy, with special reference to the treatment of pneumonia, has been increased by 18 pages in its second edition. Additional instruction for the application of diathermy to the lungs of adults and children is given. The author is now able to speak from experience gained in the treatment of 248 cases of pneumonia—more than three times the number which had been treated when the first edition of the book was published. Nearly all have been cases of lobar pneumonia. Particulars of 159 are given in tabular form. Information is given regarding the

number of lobes involved, the type of infecting organism, the day on which the treatment (by diathermy) was commenced, the number of applications and the dosage, the way in which the temperature fell, the immediate effects of the treatment, complications, and the final results of the treatment.

The author describes in detail the effects of diathermy on the pulse-rate, respiration, temperature, blood pressure, and its influence on cyanosis and sweating. He reviews critically the facts and figures when discussing the influence of the treatment on mortality. Details of a number of control cases are given. A comparison of the results obtained by diathermo-therapy with those obtained by other methods of treatment seem to justify the conclusion that the death-rate in pneumonia was lowered when treatment by diathermy was instituted. Although the mortality in some epidemics of pneumonia is extremely low, it is unlikely that this fact explains the excellence of the results obtained by the author and his co-workers over a period of five years. The original series of cases treated by Dr. Stewart were in patients in the U.S. Marine Hospital, New York. The mortality, which was very high—viz., 42·9 per cent. in the cases treated by other methods—was reduced to 17·1 per cent. in those which were treated by his method. A trial of diathermy in the treatment of pneumonia might well be made in this country.

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EUROPA YEAR-BOOK, 1927.

Edited by MICHAEL FARBMAN, RAMSAY MUIR, HUGH F. SPENDER. London: Europa Publishing Co., Ltd., 6, Duke-street, Adelphi, W.C.; and George Routledge and Sons, Ltd. With six coloured maps. Pp. 700. 15*s*.

THIS annual survey of economic and social conditions in Europe contains over 15,000 names of leading personalities in all the European countries, summarises the economic and social conditions prevailing at the moment, and provides a directory under the headings of politics, trade, science, art, and literature, in which a large number of biographical outlines will be found. It is a successful attempt to give a brief but comprehensive exposition of the numberless subjects which fall within so huge a range; the main grounds for forming an opinion on vital comtemporary questions are furnished, and furnished with a real attempt both at impartiality and at setting down only such things as can be established by fact or fortified by argument. It is certain that anyone intimately acquainted with, or expertly advised on, a particular section of activity would often find many gaps in the information supplied, but this may be regarded as due to a rigorous attempt to keep the various and varied material well balanced—an annual survey is not to be confused with an annual encyclopædia. Medical men, for example, cannot consult the Europa Year Book in place of the Medical Register, or the Medical Directory, or the contemporary medical press, or the annual reports of the Minister of Health and the Registrar-General: for specific or detailed information on particular points in the conduct of medical practice, or on the relations of medicine to the public, the usual sources of information and counsel must be gone to. Similarly, members of other professions and callings will find that the sections under their respective professional headings are strictly circumscribed in content, not only for reasons of space, but also so as to preserve proper proportion in the compilation of a compendium. Thus students of world affairs may not find an exact answer fitting any individual problem which has presented itself, but they will find fundamental facts with reference to it, if it is a problem of vital contemporary interest; the associations, the persons or the literature from which they can obtain what they are seeking will be indicated, while a quantity of assorted facts will be at their disposal to assist them in making further inquiry. The lists of learned persons and learned bodies, associations and institutions, may often seem incomplete; they are—but no such lists could ever include all that might seem satisfactory to every reader, while the really dangerous error of attributing distinction in the wrong place has been generally avoided.

The publishers may be congratulated on providing at a reasonable figure and in convenient form just such a survey of the world's contemporary affairs as men and women with wide interests desire to have, whether to assist them along a special line or to give them opportunities for broader appreciations.

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BRIGHT'S DISEASE.

*Die Nephritiden und nichtentzündlichen Nierenerkrankungen*. By Prof. Dr. H. STRAUSS. Berlin: Urban and Schwarzenberg. 1926. Pp. 400. M.21.

THERE is no alteration in the general arrangement and scope of this, the fourth, edition of Prof. Strauss's well-known monograph on Bright's disease. The subject is treated from a practical point of view, and the book is especially valuable for the detailed directions which the author gives for the treatment of the various forms of Bright's disease in their several stages. His simple classification of the clinical forms makes it easy for a practitioner to find information as to treatment of any particular patient under his care. The author maintains a balanced point of view in handling the theories of the ætiology and pathology of Bright's disease. The views held by well-known authorities, such as F. v. Müller, Munk, Volhard, Fahr, Jores, and Aschoff, are concisely summarised, thus facilitating comparison not only of opinions, but also of nomenclature.

The book is divided into two sections. The first deals with diagnosis, and contains a good review of the subject of albuminuria, as well as a detailed description of the functional tests and the conclusions that may be drawn from them. The classification of kidney diseases, their clinical pictures, and differential diagnosis also belong to this section. The second section is devoted to therapeusis. The various means of treatment are classified under the heading of causal and symptomatic treatment, the latter being further subdivided into physical, dietetic, medicinal, X ray, and surgical. The application of these methods of treatment to the various forms of kidney disease and more important symptoms is then discussed. The book closes with a short chapter on the prevention of the disease, and a useful appendix gives the chemical analysis and calorie value of all foodstuffs and fluids in common use.

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STEVENS'S MEDICINE.

*The Practice of Medicine*. Second edition. By A. A. STEVENS, A.M., M.D., Professor of Applied Therapeutics in the University of Pennsylvania. London and Philadelphia: W. B. Saunders Company, Ltd. 1926. Pp. 1174. 35*s*.

WHEN Prof. Stevens had been practising and teaching first pathology and then medicine for 30 years, he wrote a book, which now appears in its second edition only four years after publication. In the first edition it was obvious that Prof. Stevens had supplemented his extensive and mature experience by consulting the writings of many authorities, and the lists of references in the new edition show that he has spared himself no trouble in revision. New articles include those on sickle-celled anæmia, Ayerza's disease, occlusion of the coronary arteries, and lipodystrophy, while the advances made in recent years in our knowledge of diabetes, jaundice, and diseases of the circulatory system are reflected in the appropriate sections. Certain parts of the new material call for comment. For example, the description of Dick reaction for scarlet fever (p. 237) leaves some confusion between its use for testing susceptibility and its use in the diagnosis of a scarlatiniform eruption.

When dealing with nephritis, Prof. Stevens sets out a good modern classification, based on that of Volhard and Fahr (p. 814); but he almost at once abandons this scheme and treats the subject on orthodox lines with a new note on "Epstein's nephrosis."

For the most part the claim that this book is "as nearly up to date as possible" is justified. Thus in tuberculosis Prof. Stevens makes it clear that inherited predisposition is not so important as was formerly believed and he stresses direct contagion as the dominating factor. In the section on blood diseases it is satisfactory to find set out in full Sternberg's classification of the leukæmias as modified by MacCallum. In the description of cerebral vascular disease the old-fashioned clear-cut distinction between hæmorrhage and thrombosis based on blood-pressure readings is swept away with the statement "in many cases . . . . a differentiation is impossible," although the application of this point to treatment is not clearly made. Tabes dorsalis is dealt with on modern lines, but the early loss of the ankle-jerk rather than the knee-jerk should be stressed. There is a very good account of thrombo-angiitis obliterans. Such samples of many different sections of a large volume will serve to show that it contains a mass of good material and is worthy of a place in any medical library.

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PRACTICAL PHYSIOLOGICAL CHEMISTRY.

Ninth edition. By PHILIP B. HAWK, M.S., Ph.D., President of the Food Research Laboratories, Inc., New York City; and OLAF BERGHEIM, M.S., Ph.D., Assistant Professor of Physiological Chemistry in the University of Illinois, College of Medicine, Chicago. London: J. and A. Churchill. 1926. Pp. 931. 28*s*.

THE previous issues of this work were from the pen of Prof. Philip B. Hawk, but this volume is under the dual authorship of Prof. Hawk and Prof. O. Bergheim. In the preface the original author pays warm tribute to Prof. Bergheim for the par that he has played in the revision of the volume, and both authors are to be congratulated upon the excellence of their work. The contents of the book are wide and varied, and the modern developments of the subject clearly and fully set out.

In addition to bringing up to date all the original matter, seven new chapters have been added, dealing respectively with the physical chemistry of true and colloidal solutions, absorption, putrefaction and detoxication, the chemistry of the blood, respiratory metabolism and neutrality regulation, the endocrine organs and energy metabolism. In the first chapter the physical chemistry of true and colloidal solutions and its application to physiological chemistry are discussed. This is done in the space of 40 pages, and forms an excellent summary of the subject. The section dealing with hydrogen-ion concentration is written so clearly that even the most elementary student could understand and take an interest in it. In the chapter on enzymes it is instructive to see that doubt is thrown upon the value of the Abderhalden reaction. The authors make their opinion quite clear by the fact that they give one reference to work in favour of Abderhalden's views, and eight references to work which contradicts his claims.

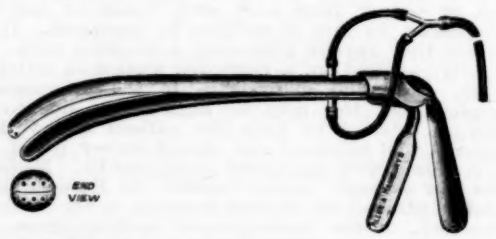
In the section on carbohydrates it is stated that "there is reason to believe that the normal organism converts ordinary glucose to the $\gamma$ variety as a preliminary to oxidation, a power which is lacking in diabetics." This should have been supplemented by reference to the various criticisms of this view. The chapter on the constitution of proteins is disappointing in that no account of the modern work on methods of protein analysis is included. The synthesis of peptides is dismissed with a word, and no reference is given to the work of the modern German school on the diketo-piperazine structure of proteins. The chemistry of gastric digestion, together with methods of gastric analysis, is dealt with in a most thorough and excellent manner. No mention is made of the methods of preparation of the bile pigments, which are very easily obtained from gall-stones, and this is regrettable, because their preparation forms a very useful exercise for students. The properties of hæmoglobin and its disintegration products are discussed rather superficially. For instance, on page 339 in a schematic representation of hæmoglobin and its derivatives and how they are obtained, hæmatin does not appear in the scheme, although acid-hæmatin and alkaline-hæmatin are shown as being obtained by the action of dilute acids and alkalis respectively on oxyhæmoglobin. The student might form the erroneous idea that hæmatin can be obtained by neutralising one or other of these solutions. The relationship between these bodies and the classical hæmatin as described by Hoppe-Seyler and by Gamgee is not made clear. In the section on blood analysis on page 371 the usual Folin method for the determination of blood-urea by distillation is given, though experienced workers know that it is impracticable owing to the excessive frothing which takes place. The authors do not mention the methods of surmounting this troublesome complication. The new chapter on the endocrine organs is a very up-to-date summary of this interesting subject, and is well adapted to the needs of students. The remainder of the book maintains a high standard. Its only possible disadvantage for general use is its high price; but it must be remembered that the volume is a very large one, comprising nearly 1000 pages, and contains complete details for practical work on almost every branch of biochemistry.

The work is one of the most comprehensive and practical to be found in any language. It is well produced, and such criticisms as we have made are noted only because further editions will certainly be called for.

# New Inventions.

## UTERINE DOUCHE DILATOR.

THE illustration shows a new uterine douche dilator made in two halves, which, when closed, resemble an ordinary uterine douche. Each half is hollow and is perforated at the distal extremity, so that fluid can pass through it and be sprayed out at




the end. The douche is passed into the uterus in the usual manner, and then by slight pressure on the handle it is made to open. By this means the cervix is held open during the process of douching, thereby facilitating the passage out of the uterus of any foreign matter.

Messrs. Allen and Hanburys, of Wigmore-street, London, are the manufacturers.

J. E. HEPPER, M.R.C.S., L.R.C.P. Lond.
Brenchley.

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BRITISH INSTITUTE OF PHILOSOPHICAL STUDIES.—A meeting of this Institute is to be held on Feb. 15th, at which Prof. Julian Huxley and Mr. Morris Ginsberg, D.Litt., are to speak on the Claims of Eugenics. Sir William Beveridge will occupy the chair. As usual a certain number of seats will be reserved for the general public and can be obtained on application to the Director of Studies at the above address.

# THE LANCET.

*LONDON: SATURDAY, FEBRUARY 12, 1927.*


## DOCTOR AND REGISTRAR.

AT bottom it is the practitioner who is the vital statistician. From his verdict as to the fact and cause of death there is no appeal; the rest is commentary or deduction—deduction, it is true, of a high numerical order but depending for its value on the practitioner's death certificate. The practitioner certifies both the fact and the cause of death. The former task is not yet laid upon him as a legal duty, but public feeling has been growing from year to year that the safety of the community is best served by making the medical profession responsible for the fact of death. Until the autumn of 1924 the formal certificate allowed him to insert the words "as I am informed," if he did not feel justified in taking upon himself the responsibility of certifying the fact of death. The new form, Y, requires him to state plainly that he has seen, or has not seen, the deceased since death, and in the new regulation which came into force with the present year [1] the local registrar is instructed to report to the coroner any death where the contents of the medical certificate show that the deceased was not seen after death by the certifying practitioner, and was not seen alive by him within 14 days of the date of death. To this extent, and of course in every case where violence has occurred, the coroner assumes responsibility, but in regard to the cause of death the practitioner's field is now undisputed. In the seventeenth century it was customary in London to swear in ancient matrons who examined "by what disease or casualty the corpse died," making their report to the parish clerk on the Tuesday in each week. More than 80 years ago, at the instigation of WILLIAM FARR, the Royal Colleges and the Apothecaries invited practitioners generally to give in every instance an authentic name to the fatal disease under their care, preferably its popular or common name, with a statement not exceeding ten words in length; and in 1845 the Registrar-General began to supply practitioners with books of blank certificates asking them to distinguish between primary and secondary causes of death. A joint committee appointed by the College of Physicians of London came to the aid of practitioners in filling up these certificates and in 1869 issued a Nomenclature of Diseases suitable to England and to all countries where the English language is in common use, with the further object of laying the foundations for a nomenclature in any language extant on earth. The former aim has been realised and the Nomenclature has appeared since at ten-yearly intervals, the current edition [2] being dated 1918, and the sixth edition being due in 1928. Their ambition to found an international nomenclature was not realised; in the early editions equivalent terms were given in Latin, French, German, and Italian, but these gradually dropped out, Italian being the first to go, and the present Nomenclature is solely in the English language. The preface expresses the hope that all medical practitioners will use the book for the return of causes of death, uniformity of terms being of the greatest importance for all statistical purposes.

Even with the aid of the R.C.P. Nomenclature the task of the certifying doctor is none too easy. The size of the 1918 edition is sufficient evidence of this; the list of diseases occupies 250 pages, and the index contains some 6300 entries. Set this against the London Bills of Mortality in 1668, when 75 headings included all possible diseases and casualties,[3] ten consecutive entries taken at random being king's evil, leprosy, lethargy, livergrown, lunatick, megrims, measles, mother, murdered, overlaid. A number of the more general terms in the present day list may seem as vague as these to a later generation, and there is certainly scope enough for choice without the use of the indefinite or undesirable terms of which the Registrar-General has drawn up a list for the guidance of practitioners. A selection from this list is given on a later page of this issue. Ten years is a long interval for revision of terminology in a live profession; terms are continually dropping out of medical use and new terms as continually gain the sanction of usage or convenience. Dr. PARKES WEBER called attention last week to some examples of this tendency and no doubt the joint committee of the Colleges will consider this and other suggestions at the forthcoming decennial revision. But even when no difficulty of nomenclature arises there are many pitfalls in the use of the partitions in the certificate. What is the primary, secondary, or terminal cause, in spite of the logical definition given on the certificate, must often remain a question of opinion. The consumptive who is attacked with influenza and ends his own life during the period of resulting depression; the diabetic woman who gives birth to a child and dies with a pulmonary embolism, are only two examples of familiar perplexities. And although the practitioner is not asked to anticipate the problems of tabulating causes of death, he is asked to bear in mind certain principles, as the inclusion under violence of all deaths from unnatural causes, including anæsthetics and poisons of all forms, the mention of childbirth wherever this has been in any way a contributory cause of death, attention to the seat of the primary lesion in cancer, and to the vaccinal state in a death from small-pox. With regard to diagnostic difficulties it cannot be too widely known that the Registrar-General welcomes information from practitioners as to causes of death not available when the certificate was issued, especially where a post-mortem examination or bacteriological investigation has thrown light on the precise cause.

The work of the Registrar-General may not be easy technically, but it is simplified in this country by the fact that he does not undertake to tabulate the causes of death, but simply what the practitioners say are the causes of death. It is not his business to revise a diagnosis even if he may be sure that it is wrong. To take an example, some hundreds of deaths yearly are certified as being due to status lymphaticus or status thymicus, in spite of the almost conclusive demonstration by Prof. J. A. HAMMAR, of Uppsala, that the criterion—namely, enlargement

[1] THE LANCET, Feb. 5th, p. 310.

[2] The Nomenclature of Diseases. Drawn up by a Joint Committee appointed by the Royal College of Physicians of London. Fifth edition, being the fourth revision. London: H.M. Stationery Office. 1918. 2*s*.

[3] Quoted in Statistical Handbook, No. 3, League of Nations Health Organisation. Official Vital Statistics of England and Wales: a Review of Existing Practice and Procedure, prepared by Dr. M. Greenwood and Major P. C. Page. C.H. 270. London: Constable and Co. 2*s*. 6*d*.

of the thymus—on which this diagnosis is based, is without value; but so long as practitioners certify lymphatism, the Registrar-General must tabulate in his list the deaths assigned to it. Similarly, food infections will still be entered up as ptomaine poisoning if the practitioner retains his faith in its existence. For his annual report the Registrar-General works on the primary causes of death as returned by the certifying practitioner, although the number of possible fatal diseases is so great that separate returns for each would be impossible. He therefore arranges the majority of these in groups of more or less related causes under single headings, and in the Manual,[4] which is summarised on page 359, reasons are given for the composition of these groups, of which there are at present 205 forming what is called the "Short List." The International Commission of 1920 gave its assent to the slight variants in this list rendered desirable by the particular circumstances of the British Isles; along with numerous deductions, eight headings of obvious value have been added—namely, encephalitis lethargica, meningococcal meningitis, rheumatic fever, diabetes, arterio-sclerosis, pneumonia, ulcer of the stomach and duodenum, bronchitis. The Registrar-General's next problem is to select for tabulation one out of a number of causes of death where more than one is given in the practitioner's certificate. The general order of preference has been chosen with a view of serving the interests of justice and public health. Violence takes precedence of every other cause, as the safety of the subject stands first. Epidemic disease takes precedence of local disease, in order that the risks to public health may be correctly assessed. The examples of selection given on a later page make good reading for the practitioner inasmuch as many of them are concerned with the dark corners of practice. Usage differs somewhat in English and Scottish head offices, but the aim is the same in both. What exactly are the principles which should guide this precedence will be again discussed at the forthcoming revision of the International List by the Health Section of the League of Nations at Geneva, when the Section will have before it the suggestions of a British advisory committee of clinical experts, on which the College of Physicians has just appointed Dr. ROBERT HUTCHISON as its representative. Finally, the General Register Office goes over the same material again at ten-yearly intervals to show the local distribution of certain causes of death. The great image built up on the practitioner's death certificate is certainly imposing, those who throw stones can only do so with any hope of success if its feet, as in Nebuchadnezzar's dream, are partly of clay.

## EPIDEMIC POLIOMYELITIS.

THE epidemic of "infantile paralysis" which occurred last autumn attracted more public attention than any previous outbreak of this disease. The chief reason was that the affected communities included a famous public school and the Military Academy at Woolwich, and owing to heated argument the main issues became confused out of recognition. The sober discussions promoted on Friday last by the Association of Medical Officers of Schools (p. 321 of this issue), and on Monday by the Medical Society of London (p. 340 of this issue), have done the great service of resolving much of this confusion and of collating the knowledge, not perfect but nevertheless considerable, possessed by those in this country who have given the subject their closest study. In Dr. JAMES COLLIER'S words, addressing the school medical officers, "the public health aspect of poliomyelitis bristles with difficulties and dangers, ignorances and paradoxes," and, so far from being disputed hotly in the daily papers, should be approached with extreme caution and in a spirit of constructive reverence exclusively by those whose experience gives them the right to undertake such a grave responsibility. The ultimate problems of the disease will be solved only by "careful clinical observation, which cannot lead us astray," and by the united efforts of general practitioners, any of whom may find out the importance of some hitherto unobserved fact.

It is practically established that the malady is communicated by human contact only, the medium of infection being the secretions from the upper respiratory membranes and the portal of entry the nasopharynx. Incidence is greatest in the late summer, and most of the victims are between two and five years of age. Incubation usually takes three or four days, but may require twelve in some patients or be complete after two in others. The infection seems to be spread almost entirely by carriers, who are generally people in whom the course of the disease has been abortive. Dr. COLLIER does not believe in case-to-case infection, and his experience of carriers is that their virulence is at its highest at the onset of the disease and wanes in a few days. The carrier does not often die, and the "chronic healthy" carrier of typhoid has fortunately no counterpart in poliomyelitis. Notwithstanding the events of last autumn, he holds it to be a fact that the disease does not like schools, institutions, and large towns, the reason being probably that the resistance of the population in these places is high. As Dr. F. WALSHE said, in opening the discussion on poliomyelitis before the Medical Society of London, "either most infants suffer from an abortive form of the disease in early life and thus acquire permanent immunity, or there is a particular and limited class of persons whose healthy nasopharyngeal secretions lack the necessary protective bodies; but whichever speculation be true, poliomyelitis certainly will not vegetate, like measles, small-pox, and varicella, on every soil. The community that has most to fear from it is the small, comparatively isolated group, which has never been "salted." Dr. COLLIER contrasts two types of epidemic, one in an "unsalted" West country village, where 45 people out of 119 contracted poliomyelitis within a few days of the arrival of a carrier, and the other in Edinburgh, a highly salted community with multitudinous carriers. The latter epidemic was limited to 62 cases of the usual spinal type. Contact was absolutely excluded in all but three patients, and only six suffered from headache. Both the authorities we have quoted agree on the importance (to any study of the epidemiology of poliomyelitis) of the work of W. W. TOPLEY and MAJOR GREENWOOD on animal communities, and of Surg.-Comdr. S. F. DUDLEY on certain semi-isolated human communities. TOPLEY and GREENWOOD found that the spread of an infection in an isolated community of mice was limited by dividing the herd into small groups and segregating them from one another. This soon got rid of the infection, but if fresh susceptibles were admitted to the herd the virulence was increased. Even when an epidemic seemed to have died down, the new susceptibles acted as

[4] Manual of the International List of Causes of Death, as Adapted for Use in England and Wales, Scotland, and Northern Ireland. Based on the third decennial revision by the International Commission, Paris, 1920. H.M. Stationery Office. 1926. 2s.

fresh fuel, resuscitating it so that in the end even the immunised members succumbed. It is much safer, in fact, to introduce a thousand susceptibles to an infected community all on the same day than 10 a day for 100 days. Comdr. DUDLEY remarked that the morbidity from infections was four times greater in Greenwich Naval School than in the London elementary schools; yet the boys in the naval school are the pick of the board schools. The reason for this, he says, is that "droplet" infections are spread essentially in the dormitory, not in the playground or classroom; the rate of spread varies inversely as the distance between individuals. In a mixed boarding- and day-school it is the boarders who suffer.

The autumn outbreaks excited a vigorous controversy between those who held that a boarding-school attacked by poliomyelitis should be enclosed and quarantined, and those who advocated dispersal, the embarrassing feature of the dispute being the assumption by either side that one policy only could be right and that the other must necessarily be wrong. It must, however, be remembered that this position was inevitable, for advice had to be given promptly in an emergency; the two policies could not run concurrently; the advisers could not give counsel which would cover two diverging procedures. Dr. WALSHE sums the question up very fairly by suggesting that to take the view that the correctness of one course is the condemnation of the other in our present very incomplete state of knowledge, "is to place a very complex situation upon the Procrustean bed of an unjustified generalisation. There are obvious objections to either policy, and it may be doubted whether either has a universal validity." Assuming that a headmaster will, as it is only reasonable to expect, consider the safety of his pupils first, and the community at large second, then the choice between isolation and dispersal must, Dr. WALSHE says, depend entirely upon the local conditions. The latest research work shows that the measures for stamping out infection in a boarding-school must include the segregation of the pupils into small groups, of which each must be isolated from every other group; the spacing of beds at such a distance that infection by droplets is impossible, and the exclusion of fresh susceptibles until a long time after the epidemic has died out. If local conditions do not permit these steps to be taken and rigorously enforced—and the number of schools in which they are practicable may be small—then the policy of isolation and quarantine is not justifiable on its merits. The possible consequences of the disease include severe and permanent disablement, and each fresh case increases the period of isolation and the chances of contact infection. The objections to the opposite policy of dispersal are also very great, for it is known that the disease is spread, perhaps entirely, by carriers, and the probability of some of the released contacts infecting the district in which they live is a formidable one. The risk will increase inversely as the effectiveness of the segregation measures taken by the parents at home. We must agree with Dr. WALSHE that, although closure is the method of choice when it can be properly carried out under ideal conditions, these conditions are not always present. Where the responsibility is assumed of breaking up a school, every possible step must be taken to enlist the coöperation of the parents in the interests of the public safety. As a matter of fact, the schools show great tendency to break themselves up, for no pupil, unless he can be regarded medically as unfit to travel either on his own account or on public grounds, can be detained in defiance of parental instructions.

## ATMOSPHERIC POLLUTION: A YEAR'S RECORD.

THE Advisory Committee on Atmospheric Pollution has just published its twelfth annual report[1] covering the year ended March 31st, 1926. The first section summarises the returns from 29 authorities having 61 deposit gauges and shows the monthly deposit divided into rainfall, insoluble and soluble matter. The insoluble matter is further subdivided into tar, carbonaceous matter other than tar, and ash; the soluble matter into loss on ignition and ash. Further partial analysis of the soluble part is made into sulphates, chlorine, and ammonia. The highest tar deposit was found at Burnley; the lowest at Bournville, Southport (Hesketh Park), and Leeds (Headingley). The highest deposit of carbonaceous matter (soot) was at Newcastle-on-Tyne (City Road); the lowest at Rothamsted. The highest deposit of sulphates was at Wakefield; the lowest at Leeds (Headingley). In most of the stations there was a slight reduction in the amount of impurity deposited when compared with the average of the previous five years, the total deposit in 36 stations being below the average in 24 and above it in 12. The deposit of tar was higher in the winter than the summer at 28 of 45 stations. The insoluble ash, with which would naturally be included wind-blown dust, was higher in the summer than the winter at 32 of 46 stations. The winter deposit of chlorine was higher in 41 of 45 stations, a fact probably connected with the stormy weather in winter which raises spray from the surface of the sea. The automatic recorders installed at Blackburn and Stoke-on-Trent show that these cities differ from other cities in the distribution of their atmospheric impurities; in the latter case the curiously irregular curves are doubtless due to the periodic emission of smoke from the pottery ovens. An attempt has been made to bring out a weekly time-table of the smoke-haze in certain localities; in Westminster there is a falling-off after Thursday, at South Kensington the haze is scattered fairly evenly over the week, while at Kew the maximum is towards the end of the week. Dust counter observations are dealt with in the third section of the report, where the method of obtaining samples of the soluble crystalline matter in the dust is illustrated, with reference to Dr. J. S. OWENS's demonstration before the Royal Society of the bearing of deliquescence of microscopic crystals on fog formation. The United States Weather Bureau has recently confirmed the relation between visibility, relative humidity, and the number of dust particles as estimated by the Owens dust counter. Illustrations are given of the curious spherical dust particles derived from furnace ash. The fourth section of the report also deals with the obstruction of ultra-violet radiation by smoke and with the quantity of smoke impurity in the air; the conclusion is reached that there is a distinct relation between the amount of radiation received on the ground as measured by Dr. LEONARD HILL's methylene-blue method and the amount of smoke pollution. The observed relation of sulphur deposit to total deposit is interesting; when the total deposit is small the percentage of sulphur is high and vice versa. For example, Leeds (Headingley) with a total deposit of 1531 metric tons per hundred square kilometres in the year shows a sulphur percentage of 23·6, while Newcastle-on-Tyne with a deposit of 21,580 for the same period shows a sulphur

[1] Meteorological Office, Air Ministry. M.O. 290. H.M. Stationery Office. 1926. 6*s*. 6*d*.

percentage of 7·1. An attempt to measure the deposit hour by hour is described by Dr. J. R. ASHWORTH in an appendix.

The valuable work of the Advisory Committee is to continue, although it is not yet quite certain under what conditions. We understand, however, that it has now been arranged for the work to be carried on under the Department of Scientific and Industrial Research, the new régime being established from April 1st next. This should be a step in the right direction as it will bring into close relationship the work of the Committee with that of the Fuel Research Board. The Committee has aimed simply at measuring the impurities in the air and collecting data on the degree and nature of pollution, whereas the investigation of methods of preventing smoke is a legitimate function of the Board. During the last year there has been a definite increase in interest taken by the general public in the purification of the air, partly due, no doubt, to the growing conviction, now a matter of public knowledge, that sunshine, and more particularly ultra-violet radiation from the sun, are essential to health. It is true that there are still many persons who do not wish to have industrial processes interfered with, however much they affect the health of others. There is, however, before Parliament a Bill which aims at the reduction of the smoke nuisance. What result will follow its enforcement it is hard to say, for as the domestic fire is not to be included in its purview we cannot hope for any reduction in domestic smoke as a direct result. Indirect advantage may nevertheless arise from the encouragement to develop smokeless solid fuels such as low-temperature coke, or to improve the quality of ordinary high-temperature coke so as to make it a more satisfactory fuel for domestic use. On the whole the prospect is brighter year by year, as more people come to realise that all is not well when they are compelled to live in a soot-laden atmosphere.

# Annotations.

"Ne quid nimis."

## PHYSICAL EDUCATION OF THE ADOLESCENT.

THE Report of the Consultative Committee of the Board of Education on the Education of the Adolescent [1] raises issues affecting not only the educational system, but also the general social and industrial organisation of the country. The conclusion is reached, from a study of the history of the development of our elementary system of education and of its present features, that all children should be transferred at the age of 11 or 12 years from the "primary" school to schools of the present "secondary" or "central" types. Both of these "post-primary" schools should give a humane and general education, but the former is designed as a stepping-stone to higher education, and the latter is to be related more closely to the living texture of industrial or commercial or rural life. In other words, "post-primary" education should be adapted to foster such inherent capacities as may be possessed by the individual scholar. In this wide survey physical training has not been omitted, but has scarcely received the scrutiny it deserves. The Committee's conclusion that every modern school should have a playing field of its own, especially in large towns, and that in crowded areas, a playfield should be provided for a group of several schools in a district, each having the right to the use of the ground on stated days, or at stated times, will be welcomed.

But many will hardly agree with the statement that "Most games and sports, while contributing largely towards general health and fitness, tend to produce a rather ill-balanced development of the body and require to be supplemented by systematic physical exercises." Does any outdoor game tend to produce ill-balanced development that really requires corrective physical exercises? The relative merits of systematic exercises and group games have not been discussed and no indication has been given as to the type of instruction, nor as to the time that should be devoted to physical education, although reference is made to the Syllabus of Physical Training for Schools, 1919, issued by the Board of Education. The Board intends shortly to publish a reference book of gymnastic training for boys' schools, other than elementary, which provides for continuously progressive training up to the age of 18, and a somewhat similar book for girls up to the age of 16, and probably it is for this reason that few details are given now. But we feel that an opportunity has been missed by the Committee in their failure to show clearly the need for a uniform and comprehensive system of training. In the "primary" schools, where the children have not yet progressed to the group game level, a graded system of exercises passing gradually into simple games and athletic activities is necessary and should be an integral part of the curriculum. The way will thus be prepared for the advance of the adolescent, in whom the communal game instinct is fairly well established. Provision must be made for a sufficiency of fully trained teachers to undertake the direction and supervision of physical training as a whole, and sufficient time should be allocated in the curriculum for such training; there must be suitable facilities and equipment for games and play, since both guidance and adequate playing opportunities are required to encourage and develop the self-reliance and restraint, loyalty and resourcefulness necessary for team-work.

[1] H.M. Stationery Office. Pp. 300. 2s.

## ENDEMIC GOITRE IN THE UNITED STATES.

IT has long been hoped that the collection of exact information as to the distribution of endemic goitre in different parts of the world would aid in the determination of the cause or causes of enlargement of the thyroid gland. Diligent search has been made for the special conditions which obtain in districts where goitre has been found to be prevalent. Geological formation, fæcal contamination of the drinking water, and scarcity of iodine in the food and drink in the affected area have, each in turn, been held to be largely responsible for the occurrence of the malady. A satisfactory solution of the problem, however, is still wanting. Goitre is very prevalent in some of the United States, and in a recent report on the distribution of endemic goitre, published by Dr. Robert Olesen [1] of the United States Public Health Service, the known facts with regard to its distribution have been brought together. Much valuable information as to the frequency of the disease in men of military age was obtained from the records of the draft examinations during the war, although, as goitre is more frequent in women than in men, the numbers obtained are smaller than those which would be got from a survey of all the inhabitants of each State. The total number of men examined was 2,510,701, and the figures show a wide variation in different States. To take a few examples: the ratio per 1000 in Idaho was 26·91, in Oregon 26·31, in Illinois 7·79, in New York 1·19, in Maine 0·66, and in Florida 0·25. Generally speaking, the figures thus collected indicated a greater frequency of goitre in the Pacific North-West and in the Great Lakes Basin than elsewhere. The results of a number of surveys made in different parts of the United States largely

[1] Public Health Reports. Distribution of Endemic Goitre in the United States as shown by Thyroid Surveys, vol. xli., No. 48.

agree with those obtained by the examination of the drafted men. But these surveys are of relative value only, owing to the different views held as to what really constitutes a goitre. It is most important that a uniform method of examination and record should be adopted in all districts, and indeed in all countries, and that some degree of abnormality should be decided on as a standard. In America some resurveys have been made, and with due precautions these should yield information of value in determining any change in the incidence of goitre which may have occurred as a result of the adoption of prophylactic measures in any given area. If possible, they should be made under the same supervisor, so that the personal factor remains constant.

So variable have been the reports from different places, that it remains difficult, for example, to decide whether the general administration of iodine to school-children in goitrous areas is desirable. In the Central States, as in other parts of the world, this measure is said to give good results, and it can hardly be thought unreasonable where its aim is merely to raise the intake of iodine to a normal level. The results, however, are conflicting, and in any case it is unwise in this country to encourage the wholesale use of iodised preparations, some of which certainly contain far more of the drug than the body normally requires. In the wise words of Dr. Donald Guthrie,[2] of Pennsylvania, "the public should be warned of the great danger in the self-administration of iodine for the treatment of goitre, and physicians should have a clear understanding of the types of goitre that are amenable to the iodine treatment, and of the danger which attends its incorrect use." Instead of this, we see articles in the lay press and notices in chemists' shops instructing people to regard iodine as a general tonic, and especially as a preventive or cure for goitre.

## ACTION OF PHENOL ON PROTEINS.

POISONING by drinking phenolic disinfectants still occurs with sufficient frequency to render any study of the action of such bodies on the constituents of the animal of interest to the medical profession. In the current number of the *Journal of Physical Chemistry* E. Ashley Cooper and E. Sanders[3] describe work on the relations of phenol to proteins and other colloids. Cooper and Woodhouse in 1923 had found that the uptake of phenol from aqueous solutions by proteins in its first stage followed the partition law—that is, there was a consistent ratio between the concentration of phenol in the aqueous solution and the protein. As the concentration of phenol was increased, the protein began to absorb greater (up to 12 times) proportions of phenol and to separate from solution. The present work has been carried out on the proteins of serum, on the muscle proteins, myosinogen, and paramyosinogen, on the vegetable proteins edestin and gliadin, on gelatin treated in various ways, and on such inorganic colloids as ferric hydroxide hydrosol and silicic acid as well as on soap. The authors point out that there is great similarity between the action of phenol, of alcohol, and of heat; they remark that those bacteria which are most susceptible to the disinfection by alcohol and phenol are also most susceptible to the action of hot water, the action in all cases being apparently due to de-emulsification of the protein. Heat coagulation of proteins like that produced by phenol is known to occur in two stages—first denaturation, then agglutination. It appears that the second of these stages is associated with the greatly increased solvent power of the protein for phenol, denaturation having no effect on the partition of phenol between water and protein. The increased absorption the authors are inclined to attribute to association of molecules of phenol. This view is somewhat supported by the relative behaviour of phenol and the less toxic dihydric phenol resorcinol which although it coagulates gelatin is, unlike phenol, not then absorbed by it to any great extent. Phenol forms associated molecules in some solvents—e.g., benzol—whereas resorcinol does not. The inorganic colloids had no absorptive power for phenol, but soap, although not coagulated, showed two stages of absorption. The denaturation of albumin by various means, including electrolysis, has recently been studied by H. Mastin and C. B. Schryver,[4] who find that a well-defined acidic product is formed containing an increased number of acid groups, but not of basic groups, and bring forward evidence for a new type of linkage of carbon and sulphur in proteins. The former work was done at the University of Birmingham, the latter in connexion with the work of the Adhesives Committee of the Department of Scientific and Industrial Research. Both researches have an important bearing on those irreversible changes induced by phenols or by electric shock, which are associated with death.

[2] Therapeutic Gazette, Dec. 15th, 1926.
[3] Jour. Phys. Chem., 1927, xxxi., 1.

## CANCER IN THE FIELD.

THE ætiology of cancer can be approached in many ways. At one end of the scale we have Dr. W. E. Gye's intensive investigations in the laboratory, at the other end Dr. L. W. Sambon's expeditions in search of significant relations between incidence and environment. The general idea behind Dr. Sambon's work evidently is that cancer is caused by a parasite, or by something like a parasite, and that this agent comes from, or has some relation to, some animal or plant. Observations along these lines appear in the third report of the Cancer Field Commission[5] which works under his direction, with the support of the Tropical Disease Prevention Association and with financial aid from the British Empire Cancer Campaign. This report describes researches on the epidemiology of cancer made during 1925 in Italy and Holland, and deals incidentally with so extraordinary a diversity of topics that it is possible to summarise only a few of them. Cancer distribution and cancer prevalence, says Dr. Sambon, vary from place to place, irrespective of climate, race, food, type of dwelling, habits, and customs. As a rule cases of cancer are distributed in groups or clusters; a first case is usually followed by one, two, three, or more cases, either in the same house or in adjoining or neighbouring houses. Frequently in a cancer cluster the patients are affected in the same organ, which suggests a common source of infection. The evidence in favour of these statements consists of maps and case-lists vouched for by local physicians and by civil and ecclesiastical authorities, but the propositions are so fundamental that they can hardly be accepted without more information than Dr. Sambon offers; the questions which they would answer are among the most difficult in statistical epidemiology. Following the assumption that cancer is indeed a disease of places, Dr. Sambon naturally proceeded to investigate the fauna and flora of implicated localities. Considerable attention was paid to worms, for, like many others, he interprets Fibiger's production of cancer by irritating rats' stomachs with the worm *Gongylonema neoplasticum* as evidence that the worm either carries a parasite which causes cancer or sets up a condition which favours the entrance of such a parasite. A number of interesting observations were made of the occurrence of species of *Gongylonema* in men, pigs, cattle, and rats, and in their intermediate hosts (cockroaches and beetles), and Dr. C. Bonne describes in detail a wild rat caught in Italy which had an epithelial tumour of the cardiac end of the stomach associated with the worm *Hepaticola gastrica*—a coincidence which has been seen three times before. The known examples of worm-infection preceding cancer in men and animals are reviewed, and Dr. Sambon rightly points out that, whatever the details of the association may be, it is no doubt possible to control the prevalence of worms by hygienic methods and so, to a greater or less degree, control the

[4] Biochem. Jour., 1926, xx., 1177.
[5] Journal of Tropical Medicine and Hygiene, August 16th, 1926.

prevalence of cancer. Tumours in plants (crown-gall, ordinary galls, &c.) are also noticed with the idea that animal cancers may have the same origin. In all that relates to worms, the Commission has had the expert help of Dr. H. A. Baylis. Mr. J. Ramsbottom similarly contributes notes on the fungi found in cancer-houses and on other matters which fall within his province. Entomology is dealt with by Mr. K. G. Blair, who investigated the insect hosts of *Gongylonema*, and the fauna of suspected houses and drinking fountains. Finally, Sir Lenthal Cheatle gives some histological notes on the tumours which were obtained. All these writers have something of interest to contribute; how far their facts really have to do with cancer time alone will show. It may turn out, after all, that cancer is due to an extraneous virus, and Dr. Sambon may be following a fruitful line in examining all the avenues by which this virus may be implanted in the body. In any case the Field Commission is pursuing a refreshingly independent course, in attempting to solve problems which ramify so widely.

## CARCINOMA OF THE SMALL INTESTINE.

Dr. Edmund M. Clark, of Indianapolis, who reports a case of colloid carcinoma of the ileum,[1] quotes some interesting statistics to illustrate the rarity of carcinoma of the small intestine. Of 466 cases of intestinal cancer found at the Vienna Pathological Institute during the period 1870-93 only 25 were located in the small intestine, 13 being in the duodenum and 12 in the ileum. A review of the recorded cases shows that primary carcinoma is commoner in the duodenum than in the jejunum or ileum, and that the jejunum is least often the site of malignant growths. According to Ewing tumours of the small intestine occur in three distinct forms: (1) As part of a general or local polyposis. (2) As multiple or single embryonal carcinoid tumours which are usually found in the ileum or jejunum as single or multiple firm opaque nodules in the mucosa or submucosa, differing in structure according as they arise from pancreatic island tissue, heterotopic intestinal mucosa, or glands. (3) As localised adenocarcinomata arising from single intestinal polypi. Most intestinal carcinomata are of the last type. The average age of patients with carcinoma of the small intestine is 46½ years, though a case has been reported in a child aged 3½ years. About 70 per cent. of all cases of carcinoma of the duodenum are localised in the ampulla. In the jejunum and ileum carcinoma occurs either as a degenerative polyp or as a ring cancer like that seen in the large intestine. The symptoms at first are indefinite, being loss of weight, asthenia, and vague abdominal discomfort. In the cases reported in the literature an early diagnosis was not made. In the later stage signs of intestinal obstruction develop. The symptoms of the greatest diagnostic value are stubborn constipation—with or without alternating diarrhœa—severe attacks of colicky pain, and vomiting. With the increasing obstruction visible peristalsis and a palpable tumour may be found. Gross blood is rarely present in the stools, but occult blood may be detected and is a useful guide to diagnosis. Radiography is also of great assistance and serves to localise the lesion, as was shown in Dr. Clark's case, with fair accuracy. The prognosis is gloomy, but is most favourable when the growth is situated in the jejunum. Treatment is, of course, surgical, lateral anastomosis being required if removal of the tumour is impossible. In Dr. Clark's case, which occurred in a man aged 59, the pre-operative diagnosis was intestinal obstruction. The patient had suffered from indigestion for many years, but there was a definite increase in the intensity of the gastric symptoms about six months before the onset of intestinal obstruction. At operation the tumour was found in the ileum about 12 inches from the ileocæcal valve. About 8 inches of bowel were resected and a side-to-side anastomosis was made. Recovery was uneventful. The growth proved to be a colloid carcinoma which is the rarest type of carcinoma found in the small intestine. In connexion with obstruction in the small intestine it should not be forgotten that a nodular constriction of the gut may possibly be secondary to cancer of some other organ as was illustrated by a case recently published by Mr. Alan Perry in THE LANCET (Jan. 29th, p. 226). A second case was described by Mr. Perry in which a ring-like stricture of the jejunum proved to be syphilitic.

[1] Surgery, Gynecology, and Obstetrics, December, 1926.

## HYPNOTISM AND ANÆSTHESIA.

THE relationship between hypnosis and anæsthesia is a close one, whether viewed historically or from the point of view of the physiologist. Historically it may be recalled that the use of hypnotism for allowing painless performance of surgical operations was at its height shortly before the introduction of nitrous oxide, ether, and chloroform. And it is probable that the work of Esdaile on hypnosis would have been followed and extended by other surgeons had it not been for the advent of these far better aids to surgery, the general anæsthetics. The physiological relationship of the two states, hypnosis and anæsthesia, was explained by Dr. S. R. Wilson in the paper he read before the Section of Anæsthetics at the Royal Society of Medicine on Feb. 4th. Both of the states mentioned depend on inhibition of the volitional cortical layer of cells and consequent freedom of the lower layers. Dr. Wilson expounded the modern view of reflex action as founded by the work of Sherrington and of Pavlov, and showed how these views provide a sane and scientific hypothesis for the explanation of the phenomena of hypnosis and suggestion, which are now, of course, completely removed in the minds of the instructed, from that suspicion of delusion or "thought-reading" or "spiritualism" with which they were formerly wont to be regarded. Dr. Wilson further showed how justly and with what great advantage suggestion may be employed for the patient's benefit if it is introduced by the anæsthetist at the correct stage of early narcosis—viz., at that time, when, although volition is abolished, senses and reflexes are active and impressionable, and memory can be firmly stamped. Dr. Wilson illustrated his theories by one or two simple, striking, and completely successful demonstrations.

## FOCAL NEPHRITIS.

IN the investigation of the diseases of any organ it frequently happens that one of the first results is the separation of some group of cases which can be given a satisfactory pathology and which form a starting-point for fresh classification. This has been well illustrated in the recent separation of coronary thrombosis from the heterogeneous mass of clinical and pathological material grouped under the heading of angina pectoris. And now acute inflammation of the kidney is being gradually classified into several subdivisions, and focal or embolic nephritis is one of the first of these smaller groups to be described. This form of acute nephritis occurs practically only in the course of infective endocarditis, and is a condition of multiple infarction of the kidney by emboli of infected material derived from the cardiac valves. Another group of cases of acute nephritis has been separated off within recent years under the heading of acute hæmorrhagic nephritis, described, as it occurred in 22 children, by W. G. Wyllie and A. Moncrieff in these columns.[1] Since this account numerous cases of the condition have been reported under the title of acute hæmorrhagic nephritis and a recent paper by W. S. C. Copeman contains the records of four typical examples.[2] It is important to remember, however, that this form of acute nephritis is closely allied to embolic nephritis in its pathogenesis. According to the description given by Wyllie and

[1] THE LANCET, 1926, i., 128.
[2] West London Med. Jour. 1926, xxxi., 225.

Moncrieff, in acute hæmorrhagic nephritis "blood appears in the urine quite suddenly, sometimes during, but usually a few days after some acute or subacute infection of the nasopharyngeal region, and may continue to be passed in smaller quantities for several days or weeks." This, these authors thought, was due to "multiple emboli of streptococcal origin without any widespread inflammation of the kidney substance." As a matter of fact this condition had already been separated from acute nephritis by Volhard and Fahr, who offered the same explanation, and a good account of it is given in Dr. Herman Elwyn's recent work on nephritis under the heading of "non-embolic focal glomerulo-nephritis." Dr. Elwyn is a New York physician, and his description of the condition is very similar to the account of it as it occurred in the 22 children referred to above, and he emphasises the importance of eliminating all possible sources of infection in cases of recurring focal nephritis. He thinks that this form is perhaps "the most common form of nephritis," and it would seem better, in view of the increasing difficulty in securing uniformity in the classification of diseases of the kidney to classify acute nephritis as diffuse or focal, and to divide the latter group into embolic and non-embolic, limiting the term embolism to the gross infarction occurring in infective endocarditis. The term acute hæmorrhagic nephritis is thus avoided, which is probably advisable, since it may rightly be pointed out that all acute nephritis is hæmorrhagic, and the name does not give the clue to the essential features of the disease as the term "focal" certainly does.

## DR. LEONARD HILL'S PICTURES.

AN exhibition open until Feb. 25th, at the Alpine Club, Savile Row, of paintings by Dr. Leonard Hill will repay a visit; it shows that Dr. Hill has definitely joined the small band of medical men, like Prof. Tonks and the late Sir Francis Seymour Haden for example, who have found in a medical training a sound introduction to artistic performance. Of Leonard Hill of the National Institute of Medical Research his colleagues know a great deal, and some of them are also aware that he has practised painting as a recreation for many years, and has previously exhibited some of his work. But no so large and varied a collection of his paintings has, we think, yet invited public attention. There are upwards of 120 works in the Alpine Club Gallery, composed of a few pastels, and 36 water colours, the rest being in oil. While the works, whatever the medium, vary from elaborate pictures to what may be regarded as interesting notes in colour, whether they be large or small, and whether solid or elegant, they have in common the properties of luminous colour and high regard for spatial perspective. Large, almost architectural, skies are made to reach over the landscape and to recede from the eye, and even in many of the smallest pictures the effect of a considerable range of scene is obtained by scrupulous regard for values. And it is only here that Dr. Hill has any scruples—i.e., allows any discipline to control his work, for most of it has the unrestrained vigour born of that convinced intention and prompt execution which cannot be tied by regulation. Many of the effects are obtained by an easy mastery of water or oil that is hardly expected from a painter who has gone through no intensive training at the student age. For examples of these qualities the following pictures may be instanced. First, in oil we should notice "The Harvest Field" (4), "The Poultry Yard in Snow" (2)—all kinds of poultry and especially turkeys have a great fascination for Dr. Hill—"A Summer Pasture" (21), "The Hen Run" (22)—a delightful little scene, "A Pastoral" (51), and "A Sandy Shore" (69); while the pictures numbered 33, 55, and 57 are good examples of the painter's objective and technique. It is probable that among the water-colours more popular favour will be obtained, but there is no concession made here by Dr. Hill to those who want merely pretty things. The water colours are as strong and as sincere as the oils, and several of them have high emotional value. "Light on Cloud and Sea" (4), is a quiet and mysteriously luminous picture; "Sunrise Colours the Shore" (5), is gorgeous and happy; "The Rainbow over the Sea" (26), and the "Swede Heap" (27)—pictures at the extreme ends of Dr. Hill's range of work—show his familiarity with atmospheric effects, and four Alpine Studies render faithfully the peculiar brilliancy of the snow scenes. Dr. Hill is to be congratulated upon his exhibition.

## STANDARDISATION OF ULTRA-VIOLET RADIATION.

A CHEMICAL method for the standardisation of ultra-violet light is described in detail by J. E. Moss and A. W. Knapp in the *British Journal of Actinotherapy* for January. It is to be known as the Uroxameter method, the name being apparently coined from two of the substances forming the chemical solution acted upon by the rays. This solution consists of 20 c.cm. of a 2 per cent. solution of oxalic acid, 5 c.cm. of a 1 per cent. solution of uranium acetate, and 20 c.cm. of distilled water. It is put in a circular flat-bottomed vessel which is 16 cm. in diameter, and has vertical glass walls, 8 c.cm. high, and these walls are painted on the outside with one coat of red paint and three coats of white, so that the interior of the vessel appears red and the passage of light through the sides is prevented, while the white paint serves to reflect heat from the outside. On top of the cell can be fixed a gas-tight lid of fused transparent silica. The vessel containing the solution is placed 6½ inches below the centre of the lamp to be tested, and is rotated by means of a table at 5–6 revolutions per minute. Part of the test solution is titrated with a decinormal solution of potassium permanganate, in order to find the amount of oxalic acid which it contains. Of the remainder, 45 c.cm. is then exposed to the light for 30 minutes and afterwards again titrated. The percentage of oxalic acid which has been decomposed can then be ascertained, and this is proportional to the amount of radiation absorbed. A large number of estimations have been made by this method to determine such diverse values as the variation in radiating power of mercury lamps, the colour-destroying power of the radiations, and the transparency of various glasses. From spectrometer determinations it is clear that this solution strongly absorbs radiations shorter than 3200 A°V, and is therefore an appropriate medium where effects are due to rays in this region of the spectrum. The tests suggest that the method can be relied on for quantitative purposes, and we can well imagine that it would probably prove economical and suitable for industrial work. It is not one, however, which is likely to be adaptable to medical requirements. Here, as in the field of X rays, the first essential of any device for measurement, either of the intensity or of the total dose of radiation, is that it should be easy to use it at the same time as when the rays are actually being employed in treatment.

## THE FUTURE OF THE FOUNDLING HOSPITAL ESTATE.

THE signatures of a complete list of the medical men and women residing on the Foundling Hospital estate are appended to the following letter which has been addressed by them to Mr. Neville Chamberlain, the Minister of Health:—

We, the undersigned medical men and women residing on the Foundling Hospital Estate, view with grave concern the growing tendency to build over the open spaces in the centre of London. Endsleigh Gardens and Mornington Crescent have already been sold for building purposes and a Bill is to be introduced in Parliament in the ensuing session, with the object of obtaining power to erect a market on the grounds of the Foundling Hospital and the adjoining squares. This site is largely surrounded by thickly populated areas and in its immediate vicinity are no less than seven important hospitals. Any diminution of the open spaces in this neighbourhood is bound to have an adverse effect on the health of the community.

Open spaces, by acting as natural ventilators of the surrounding streets, diminish the incidence of infectious disease. In London they have undoubtedly exercised a considerable influence in producing a low death-rate and a general high standard of health. In this connexion it is worthy of note that the children of Foundling Hospital have been, over many years, extraordinarily free from tuberculosis, no definite case having occurred during the past decade.

We would respectfully urge your consideration of the matter, and venture to suggest that the permanent preservation of the squares of the Foundling Hospital Estate would be a measure in the best interests of public health, and one which we earnestly hope may receive the sympathetic consideration of the Government.

The letter is signed by:—

C. T. Bishop, M.B.; J. Christie-Anderson, M.B. Ch.B., L.D.S.; D. Constantin, M.R.C.S., L.R.C.P.; M. Dia, M.B., B.S., D.P.H.; Wm. M. Fairlie, M.D., D.P.H.; James Harold, L.R.C.P.I. and S.I.; A. O'Dwyer Kennedy, B.A., M.R.C.S.; D. A. D. Kennedy, M.C., M.B., Ch.B.; James Kerr, M.A., M.D., D.P.H.; Edward Knight, M.R.C.S.; W. B. Knobel, M.D., M.R.C.P.; Wm. Macleod, M.B.; E. Miller, M.A., M.R.C.S., D.P.H.; C. J. O'Brien, M.B.; J. J. O'Donnell, L.R.C.P.I.; Olive Rendel, M.D., M.R.C.P.; Maude M. Richards, M.B., B.S.; J. V. Rees Roberts, M.D., D.Sc.; Eleanor C. Thistlethwaite, M.B., Ch.B.; A. F. Whyte, M.B., Ch.B.; G. C. Nelson Younger, M.R.C.S.

We trust that the views of these representative signatories will receive close attention before the future of the Foundling Hospital estate is definitely settled. The value of preserving all possible open spaces in the more densely populated regions of the metropolis requires no argument, while other factors might have been introduced into a petition for the favourable notice of the Minister of Health. The architectural features of the building are a heritage from the eighteenth century which should not lightly be dissipated, while this particular area of London has been lately regaining its residential character, and for many years has been meeting the needs of large and important sections of society whose interests are as worth considering from the public point of view as any commercial amenities. We can conceive that with the gradual reconstruction of some of the larger houses into flats, alongside with the preservation of the beautiful gardens of the Foundling Hospital, a residential quarter already planned in bulk might develop into a real source of benefit as well as æsthetic delight.

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Mr. Neville Chamberlain, Minister of Health, has promised to unveil a memorial tablet to the late Sir Patrick Manson in the Manson Ward of the Royal Albert Docks Hospital, where he laid the foundations of the teaching of tropical medicine in this country, and where he carried on much of his research. The ceremony will take place on Tuesday, March 15th, at 3.30 P.M., and a train which leaves Fenchurch-street Station at 2.20 and arrives at Connaught-road at 2.41 P.M. will be found convenient. It is announced that Messrs. Cassell and Co. will publish "The Life and Work of Sir Patrick Manson" on March 10th.

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Messrs. Martin Hopkinson and Co., announce the publication of a volume entitled "Medical Views on Birth Control." Edited by The Rev. Sir James Marchant, it contains an introduction by Sir Thomas Horder and contributions from Dr. H. Crichton-Miller, Dr. Leonard Hill, F.R.S., Dame Mary Scharlieb, Dr. A. E. Giles, Dr. R. C. Buist, Dr. Letitia Fairfield, Sir Arthur Newsholme and Sir John Robertson.

SCIENTIFIC CINEMATOGRAPHY.—The Confédération Internationale des Etudiants has founded a Scientific Cinematograph Commission, consisting of representatives from student organisations in all countries, for the purpose of preparing an international catalogue of scientific films. To awaken interest in this country in scientific cinematography the National Union of Students of England and Wales has organised an exhibition of scientific films at its third annual congress to be held at Bristol from March 24th to April 1st. There will be a special exhibition of medical films, probably showing radiography and trepanning. Full particulars may be had from the Congress Secretary, the National Union of Students, 3, Endsleigh-street, London, W.C. 1.

# Modern Technique in Treatment.

*A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.*

## CCX.—TREATMENT OF ACUTE RETROPHARYNGEAL ABSCESS.

THIS article will be restricted to a consideration of the acute form of abscess which occurs behind the pharynx, most commonly in children under 3 years of age. No attempt will be made to discuss the rarer variety of retropharyngeal abscess, where the disease originates in the cervical vertebræ and remains behind the prevertebral layer of the deep cervical fascia. This latter form of the disease is to be recognised by the greater chronicity of its symptoms, and by signs which point to a lesion in the vertebral column. It is important to realise that the chronic abscess (usually tuberculous) is best approached by an incision in the neck, and in this respect differs from the acute and commoner form.

### *Ætiology.*

Acute retropharyngeal abscess arises either by direct spread backwards from an inflamed tonsil or by involvement of a group of lymph glands secondary to a tonsillar or postnasal infection. These lymph glands are said to be present behind the pharynx in children, but to disappear in later life. Acute retropharyngeal abscess constitutes a surgical emergency and may demand immediate operation to save life. Its diagnosis is more often missed than that of any of the dangerous conditions commonly encountered in the surgery of children, not excepting acute intussusception. The patient is most commonly a pale debilitated child who may or may not be suffering from obvious dyspnœa. The mother will probably say that for two or three weeks she has noticed that he has gone off his feed, dribbled a lot, or even regurgitated food which she thought he had swallowed. She will usually describe unwillingness to take food and does not realise that her baby either cannot swallow or else has experienced such pain and respiratory distress on attempting to do so that he has given up trying. Dysphagia is only sometimes present, but dyspnœa in invariable. Most mothers regard food as more important than air and hence the respiratory symptoms are quite unjustly often given second place. The child "snores" (snoring is not common in babies), "goes black in the face when he cries," or "makes a rattling noise when he breathes." Sometimes a swelling of the neck will have been noticed, but the most common maternal diagnosis is "croup."

In any case if there is nothing pathognomonic in the picture, there should be enough to suggest that the child is suffering from an obstructive dyspnœa. If students were taught always to think of retropharyngeal abscess, and always to feel for it, in every case of obstructive dyspnœa, it would be less often passed over as "glands" or sent to fever hospitals as "laryngeal diphtheria." The finger is the final test. Until the examiner has palpated the posterior pharyngeal wall, and thus incurred the noisy wrath of the infant and the silent reproach of the parent, he cannot exclude a retropharyngeal abscess. The index-finger passed backward through the arch of the fauces of a normal child comes upon the bodies of the cervical vertebræ covered by prevertebral fascia and pharyngeal mucous membrane. Upwards and downwards as far as the finger can reach there is a sensation of smooth hardness, much as is to be felt along the subcutaneous surface of the tibia. If an abscess is present it may be seen with the aid of a tongue depressor, but the finger is the more reliable guide because the abscess may be too low to be visible. Instead of uniform hardness a boggy swelling is felt on one side of the mid-line immediately behind the posterior pillar of the fauces. Its size

varies from that of a hazel nut to a bantam's egg, and its consistency suggests an over-ripe plum. The finger in the baby's pharynx is of equal importance to the finger in the adult's rectum, and often gives more information. It only remains to be added that large abscesses may be ruptured in this way unless the greatest care and gentleness are used. The treatment may be considered under three heads: (1) immediate or operative; (2) post-operative; (3) removing the primary focus.

*Operative Treatment.*

Operation consists in opening and evacuating the abscess cavity which lies behind the pharynx and in front of the prevertebral fascia, almost invariably to one side of the mid-line. The difficulties and dangers associated with such a simple procedure are due to the position of the abscess at the inlet of the respiratory tract; the necessary precautions are directed to the maintenance of an open airway.

The patient is placed in the dorsal position on the operating table with a sandbag under the shoulders. The head is extended as far as possible and the end of the table is lowered to lessen the risk of pus being aspirated into the lungs. The surgeon sits at the patient's head. A good light, though not essential, adds precision to the final stages of the operation. If an overhead multiple-reflecting lamp is not obtainable, the Milsom-Davidson tonsil lamp is an excellent and portable substitute. Many operators prefer to use no anæsthetic, and only light open ether is permissible. The mouth is gagged open as widely as respiration permits and the tongue seized with spiked forceps. A scalpel, guarded by adhesive plaster except at its distal quarter inch, is plunged into the wall of the abscess and at once withdrawn. There is an immediate rush of pus varying in amount with the size of the abscess. If the mouth and pharynx immediately fill, the surgeon should use gravity to the fullest extent by asking an assistant to lift the patient by the legs, he meanwhile controlling the head and assisting gravity by rapidly swabbing out the pus. Adults or large children must be turned on the same side as the abscess. Respiration will proceed unimpeded when the first rush of pus has subsided, and the operation may be completed at leisure. It is now that an anæsthetic is useful. The incision is enlarged if necessary to admit the tip of a finger, and the abscess cavity is digitally explored. The opening must extend down the pharynx to the limit of the cavity; the importance of this step is second only to that of safeguarding the child's life in the first part of the operation. This downward extension of the incision is best accomplished by the finger, and sometimes requires a little force. Finally, a thorough inspection is made of the cavity, which is cleaned with ribbon gauze and left open. The patient is returned to bed and if ether has been given he is placed upon his side until consciousness returns, then moved to the sitting position and kept there. If no anæsthetic is used he should be sat up immediately the operation is finished. Sometimes it will be necessary to consider immediate operation either in the patient's house or the doctor's surgery. Although the practitioner may quite fairly be anxious to get the child into hospital or into the hands of a surgeon, he should not hesitate to operate himself if he thinks the unavoidable minimum of delay is likely to be dangerous. In making this decision, he should be guided by the degree of respiratory embarrassment present and the rate at which it is progressing. If the child does not seem to have become worse during the last few hours it will probably be safe to wait until further arrangements can be made. Any cyanosis must be taken as a danger signal demanding immediate operation because small children are most intolerant of even slight degrees of asphyxia. It must not be thought, however, that cyanosis is the key to the decision as it occurs late and the real danger is syncope rather than asphyxia. If immediate interference is necessary, the doctor should rapidly perform the operation described, above with such modification as circumstances may dictate. Tracheotomy should never be necessary.

When treatment is undertaken in the casualty or out-patient department of a hospital, the patient ought, if possible, to be admitted for at least one night after operation.

It may be thought that in these enlightened times, with our aspirating needles and evacuating motors, we need no longer have recourse to such mediæval practices as are implied by guarded scalpels and holding patients upside down. It is doubtful, however, whether modern methods or instruments have contributed anything to this particular operation. Moreover, the mechanical factor is sometimes less reliable than the human, and a momentary hitch may be a very serious matter for a child undergoing operation for retropharyngeal abscess.

*Post-operative Treatment.*

The ordinary acute case is well in from three to five days, but about half the patients will require treatment in bed for a longer time. The commonest complications are septic bronchitis, broncho-pneumonia, refilling of the abscess cavity, and mediastinitis. The best treatment of all four complications is prophylaxis during the operation, and it is doubtful how far drugs are effective either in the primary condition or its complications. If a local application is used after operation, chloramine ½ per cent. as a throat spray is satisfactory, and a mixture containing ammonium carbonate and ipecacuanha is usually given for bronchitis. If the abscess cavity refills it is nearly always because the incision has not been carried low enough and this must be corrected at once.

It is remarkable that some of these patients after operation will suffer from diurnal fever up to 104° F. and yet make a gradual and complete recovery, even though high fever may have persisted for a long time—e.g., 39 and 21 days.

*Removing the Primary Focus.*

The infecting organism is almost always the streptococcus, and its port of entry the tonsil. As soon as the patient has recovered from his acute illness the tonsils must be dissected and the adenoids removed. In retropharyngeal abscess, as in acute mastoiditis, a slow convalescence can sometimes be surprisingly hastened by a timely removal of the primary focus. When a small abscess is present, it is sometimes good practice to remove the tonsils and adenoids at the same time as the abscess is evacuated. The youth of the patient is no bar to the removal of tonsils and adenoids if Waugh's method be used. A retropharyngeal abscess left to itself will probably kill the patient; nevertheless it is a disease amenable to surgery of the simpiest kind, and demands only a careful attention to detail to give the most satisfactory results. Sudden deaths, however, do occur, and although the mortality after operation is probably less than 5 per cent., the prognosis must always be guarded.

ERIC I. LLOYD, M.B., B.Ch. Camb., F.R.C.S. Eng.,
Surgeon to the Hospital for Sick Children,
Great Ormond-street.

LADIES' COMMITTEE AT ST. GEORGE'S HOSPITAL.—Princess Marie Louise presided recently at the inaugural meeting of the Ladies' Committee which has just been formed to help St. George's Hospital. It was announced that Mr. Bernhard Baron had given £5000. The hospital is in need of a good supply of radium, about £2000 worth being required.

EXTENSION OF MANSFIELD HOSPITAL.—Plans have been approved for the enlargement of Mansfield and District Hospital at a cost of £50,000, of which £10,000 has been given by the Bolsover Colliery Company and £5000 by the Sherwood Colliery Company. The extensions will increase the number of beds from 112 to about 180. The institution serves a population of 150,000, which is rapidly increasing in consequence of the development of the North Nottinghamshire coalfield.

# Special Articles.

## THE TREATMENT OF VENEREAL DISEASES.

### MEETING AT CAMBRIDGE.

THE first provincial meeting of the Medical Society for the Study of Venereal Diseases was held at Cambridge on Jan. 29th. Sir HUMPHRY ROLLESTON, President of the Society, took the chair and opened the proceedings with an address on

SPECIALISM IN MEDICINE.

The Society, he said, confined its energies to the medical aspects of a most important cause of individual disease and of national deterioration. The question whether or not specialism was good or bad for medicine as a whole had been settled long ago, but with the birth of each new specialty there was always a feeling of reluctance of the parent body to part with its offspring. There was, of course, a good deal to be said against the progressive disintegration of medicine entailed by the segregation of those specially interested in a particular organ or part of the body, for eventually, if carried to its logical conclusion, the mosaic of general medicine might be so broken up as to bring about a reversion to the state of affairs in ancient Egypt about 500 B.C., when each disease had its own expert who did not concern himself with anything else.

With the ever-increasing scope of medicine and surgery the evolution of specialism had kept pace; first came special hospitals, such as the Royal Ophthalmic Hospital, Moorfields (1804), the Royal Hospital for Diseases of the Chest (1814), the Royal Ear Hospital (1814); then special departments at general hospitals were started and were officered by their own general physicians and surgeons. The special hospitals had naturally been first in the field with medical officers who confined their activities to the diseases treated at the hospital, but he could remember the time when nearly all the surgeons at the Royal Ophthalmic Hospital were general surgeons on the staff of teaching hospitals.

What were the reasons, asked the President, which should weigh in deciding what was and what was not a real and legitimate specialty? The amount of special knowledge and experience must be so considerable as to make it extremely difficult, if not impossible, for a general physician, surgeon, or practitioner competently and conscientiously to undertake the work and responsibilities in addition to his other manifold duties. The second and probably the more important criterion was the degree of technical skill required for discharge of the methods of diagnosis and treatment of the conditions constituting the particular branch of medicine or surgery. In the early treatment of venereal disease, if it was to be efficiently carried out, the technique demanded considerable training and experience, and, in order to maintain the standard consistent with the best results, constant practice was essential. A third reason for the establishment of a specialty was to counteract, in the interests of the public, the activities of irregular practitioners, for any branch of the healing art which did not greatly interest the majority of medical men was likely to be neglected, and as a result there was an opening for irregular practitioners. In no branch of medicine was there more danger than in venereal disease that members of the public would resort to advertising quacks.

The real function of a specialty was essentially to facilitate intensive study of the subject and to perfect technique. Those working in special departments, therefore, were leaders and courts of appeal for the rank and file of the profession, who necessarily had to deal with the bulk of the patients. To recall this might not be out of place in the light of the dictum of a practitioner, probably irritated by the real or fancied loss of his clients, "Never send a patient to a specialist." "Specialist" and "consultant" were not quite synonymous terms in practice, though the specialist was much the same as a consulting surgeon in operating on patients, whereas a consulting physician's activity was usually limited to prescriptions and verbal advice. The true and most beneficial function of a specialist was, of course, to be the guide and co-worker of the medical practitioner, and not to take his place entirely.

*Relation of Syphilology to Other Specialties.*

Venereal disease in the past, continued the President, had been more closely allied with what, in contradistinction to internal medicine, the province of the physician, might be called external medicine—namely, surgery and especially urology, so that genito-urinary departments had undertaken the treatment of syphilis and gonorrhœa. More recently dermatology, which more justly deserved the title "external medicine," had taken syphilis under its wing, as was shown by the names of various journals such as the *British Journal of Dermatology and Syphilis*. Syphilis—which obviously had important relations with dermatology, as it had with all organs of the body—had thus been separated from gonorrhœa, which had so few connexions with dermatology. This was an artificial distinction, as it separated two diseases of venereal origin. The position of venereal disease as a special branch of medicine based particularly on ætiological considerations was rather different from that of other specialties which dealt with the disorders, whatever their nature, of an organ, locality, or system. Further, the late results of syphilis, which might occur in practically every tissue and part of the body, brought it into close relation with all the divisions of medicine. But these late results of syphilis should be under the care of the general physician, surgeon, or practitioner rather than exclusively of the specialist in venereal diseases. On the whole there was more to be said in favour of allying venereal diseases with genito-urinary disease as a comprehensive specialty than for their association with dermatology. With some familiar exceptions gonorrhœa and syphilis in their early stages were local lesions on the genitals and so must be distinguished from non-venereal diseases in the same region, and the complications of gonococcal infection mainly came within the scope of genito-urinary surgery. But genito-urinary workers had comparatively recently (1920) united with those interested in the medical diseases of the kidney to form a section of urology at the Royal Society of Medicine, so that there was an opportunity for a triple alliance and extended team-work.

The study of venereal disease, said the President in conclusion, could not be a subordinate part of any other specialty, for this would narrow its outlook and activities; it demanded intensive work, special technique, and thus, as the special departments and clinics for venereal diseases at the hospitals and under the Ministry of Health showed, had won its place as a recognised specialty. The opportunities for research were most attractive and its potentialities for good in improving the national health must appeal to all who had humanitarian and sociological ambitions.

After the President's address two films dealing with gonorrhœa and three films on syphilitic infection and the technique of its diagnosis were shown by Lieut.-Colonel L. W. HARRISON. Before showing his films Colonel Harrison said that the primary object of the demonstration was to popularise a method of teaching by cinematograph demonstration.

*Gonococcus and Streptococcus.*

Dr. CHARLES SEARLE described three cases of septicæmia which arose after gonococcal infection. This form of septicæmia, he said, was commoner in men than in women, and in pregnant than in non-pregnant women, and was more often responsible for fatal puerperal septicæmia than was, perhaps, generally realised; in fact, of the 6000 deaths every year in childbirth a very large proportion were from

this cause. Infection occurred through an abrasion of the mucous membrane which in a man might be due to the passage of a metal bougie. Dr. Searle then showed specimens from two single young girls of 20 years of age who came from the country.

The first girl came in desperately ill and practically moribund with a temperature of 103° F., which was rather unusual in such cases. She had been under treatment privately for six months for a vaginal discharge. When he gave her the ordinary routine examination much to his surprise he found a foreign body in her posterior fornix which turned out to be a hairpin. She admitted that she had run risks, but would not admit that in order to procure abortion she had inserted a hairpin which had actually penetrated into the bladder. She died with streptococcal abscess in her kidneys and general septicæmia.

The second girl first came to the clinic 15 months before her death, but ceased to attend before her course was completed. Seen 15 months later she had chronic gonorrhœa and was ten months pregnant. She had also a contracted pelvis which necessitated craniotomy. Within 56 hours of her confinement she had a very slight rise of temperature, never much above 100°, and without much increase in pulse-rate, and she died of septicæmia after 20 minutes' unconsciousness.

Dr. Searle's experience was that they only found the gonococcus in one case out of 20, and that the gonococcus paved the way for the streptococcus. There were several things they had to learn from those cases; it was quite certain that prenatal treatment would do a great deal to save such women if caught at an early stage. The Society could do a great deal by propaganda among midwives and general practitioners, urging them to send any cases of possible gonorrhœa. By 15 days' in-patient treatment they could very often cure these patients, but it was very difficult to tell whether they were clear or not. In Cambridge they had not the proper facilities for dealing with these cases, nor the necessary lying-in beds.

Dr. J. R. C. CANNEY thought that it had been rather lost sight of that the gonococcus made the way easy for the streptococcus to do its worst. Of late a big move had been made to try to reduce the incidence of puerperal septicæmia, and some interesting work had been done with regard to the bacteriology of the vagina and cervix during pregnancy. In quite a large proportion of pregnant women it had been found that virulent streptococci were actually growing in the cervical canal. It was, therefore, not difficult to understand, if those conditions were present, why septicæmia was common. He did not say that all such cases with infected genital tracts had previously been infected with gonorrhœa, but a very mild unrecognised attack of it might have been a predisposing cause in a fair proportion of cases.

Colonel HARRISON had long been convinced that the gonococcus was responsible for a good deal of puerperal septicæmia. It had been found that in the venereal wards the maternity cases ran at a more level temperature than in the other wards of a maternity hospital. He thought that was due to the fact that they had had antenatal treatment. If beds were wanted locally, and they could prevail on the local authority to apply to the Ministry of Health, they would find that the Ministry was very sympathetic.

Dr. D. C. LOGAN had been informed by one of the Ministry of Health inspectors of the venereal diseases block of the maternity hospital of which she was in charge that the morbidity was on the whole less than in the clean blocks of the hospital. They usually got their cases at that particular hospital a good long time before confinement was due. The hospital was associated with hostels, and they often had the opportunity of getting the cases when the patients were only about five months pregnant. In a large proportion of cases the gonococcus could not be found. The clinical history was often suggestive and they found that a very large proportion of the cases they dealt with were originally gonorrhœal, secondary infection resulting in many cases. On the whole they had been very fortunate, and she thought it was because they managed to get early treatment. Where they did get temperatures they usually occurred among the cases which they had not had under treatment or observation for any long time.

Dr. D. NABARRO said that he had great faith in the antenatal treatment of those cases. It was astounding to him, when he first started that work, to see the women who came up with tremendous discharges. After they had been treated they cleared up and had a normal confinement. He would like to urge that every town with a population large enough to support it should have a hospital for the treatment of such cases.

After the meeting a dinner was held in the Old Library of Pembroke College, at which Sir Humphry Rolleston presided, and some 30 to 40 members and their friends were present.

## IRELAND.

(FROM OUR OWN CORRESPONDENT.)

### *Paying Patients and Public Hospitals.*

THE Department of Local Government and Public Health has recently circulated to county boards of health throughout the Free State a draft copy of regulations to cover the admission of paying patients to public hospitals. For such patients to be admitted, regulations must be adopted by the county board of health and approved by the Minister. It is to be noted that in some counties it was one of the terms of appointment of the surgeon to the county hospital that he should be permitted to treat paying patients in the hospital, but in few areas regulations have been adopted to give legal sanction to this arrangement. The draft regulations now issued are carefully framed. They provide that a county board of health may set aside a ward or wards as paying wards, for the reception, maintenance, and treatment of persons not eligible for relief; that any person seeking admission to such wards must apply to the surgeon, or if he is absent, in case of urgency, to the matron; that any person so admitted shall pay a certain arranged sum for each day he is in hospital, together with appropriate additional charges for any special nursing or other expenses incurred in connexion with his treatment; that the surgeon may agree with such person as to the terms upon which he shall be treated, but that he shall out of any such sums received by him make good to the board of health any sums due by the patient to the board of health, and not paid to or recovered by the hospital; that the surgeon, if the patient so requires, shall permit any duly qualified medical practitioner to have access to such patient, and shall, so far as possible, act in consultation with such practitioner.

The draft regulations appear to meet the claims put forward on behalf of the medical profession at different times. In particular, the provision which permits a paying patient to retain the services of his own doctor, meets the objection, often raised, to the privileged position which the right to admit paying patients to a public hospital gives to the surgeon of the hospital. With goodwill between the hospital surgeon and his medical neighbours the regulations should work well.

### *The Training of Nurses.*

Miss K. Price, secretary of the Irish Nurses' Union, gave evidence last week before the Commission on Technical Education. She pointed out that where candidates had only national school education, the gap between the school-leaving age of 14 and the entry to hospital at 18 to 21 was injurious. She suggested that the gap might be filled by a preliminary course in domestic service, hygiene, and physiology. She thought the profession of nursing much overstocked in Ireland. There was no general pension scheme for nurses, and nurses had to continue working till they dropped. Salaries were lower in Ireland than in England.

# CERTIFICATION OF THE CAUSES OF DEATH.

## ISSUE OF A NEW MANUAL ON THE INTERNATIONAL LIST.

The new manual of the International List of Causes of Death, as adapted for use in England and Wales, Scotland and Northern Ireland, has just been issued by the Stationery Office (1926. 2*s*.). The International List was revised at a conference held in Paris in 1920, but its publication was delayed until 1923 by the death of Dr. Jacques Bertillon, Secretary-General of the Conference, and the present explanatory manual has taken another three years to prepare. It has now been issued on the authority of the Registrars-General of the three countries with a view to providing for the use of public health officers, the medical profession generally, and any others interested, an official statement of the practice in force in the several parts of the United Kingdom with regard to the classification of causes of death. The object of the manual is twofold (1) to ensure uniformity of practice in tabulation; and (2) to elucidate the precise significance of each title in the list by cataloguing the forms of death certificate assigned to it. A similar manual has been issued for the United States of America. The present British manual differs from its first issue in 1912 by various adaptations to local national requirements and by a revision of the rules followed in selecting a single cause for tabulation out of two or more recorded on the same death certificate. The Health Section of the League of Nations is now making an endeavour to increase the comparability of the death statistics of the countries issuing the International List and the revisers of the manual have therefore considered the present time inopportune to make any considerable change. They suggest, however, that the utility of an arbitrary code of rules in the tabulating department would be greatly affected if it were found possible for the death certificate itself to contain such indications as would enable the selection to be determined by the practitioner's own separate judgment.

### TABULATION OF CERTIFICATES AT THE HEAD OFFICE.

The manual sets out the principles on which one cause is selected for statistical purposes when several causes are stated on the certificate. The rules are not quite the same for all parts of the country. In England, Wales, and Northern Ireland the general order of preference is as follows:—

(1) Violence;
(2) Epidemic, Endemic, Infectious and General Diseases;
(3) Local diseases;
(4) Ill-defined causes of death.

*Selection when more than One Cause of Death is Stated.*

*Violence.*—Where any forms of violence and disease are jointly stated as causes of death, the violence is to be preferred except in the following instances:—

(*a*) Deaths from any definite disease stated to have been accelerated, aggravated, &c., by accident are to be classed to the disease.

(*b*) Deaths during or resultant from operation or the administration of an anæsthetic are to be classed to the disease or injury for which the operation was performed.

(*c*) Deaths from pneumonia or other lung diseases consequent upon accidental immersion are to be classed to the disease.

(*d*) Deaths from injuries received during an epileptic or apoplectic fit are to be classed to epilepsy or apoplexy as the case may be.

(*e*) Deaths from tetanus, erysipelas, pyæmia, septicæmia, blood poisoning, &c., following accident are to be classed to the disease if the injury was slight, such as "scratch" or "abrasion," but if the injury was apparently severe enough to be of itself dangerous to life—e.g., by vehicle, machinery, &c.—the death is to be classed to violence.

(*f*) Deaths from fracture occurring as a consequence of cancer are to be classed to cancer.

*Epidemic, Infectious and General Diseases.*—Any disease in these classes is to be preferred to any local disease except tabes dorsalis (locomotor ataxy), general paralysis of the insane, and aneurysm, which for this purpose are included with the general diseases in Group III. and strangulated hernia and acute intestinal obstruction, puerperal sepsis and puerperal phlegmasia alba dolens not returned as septic which are included in Group I. below. The trifling exceptions to this rule are in regard to:—

(*a*) Tumours not returned as malignant (brain and female genital organs excepted), diseases of the endocrine glands (diseases of the pituitary gland and adrenals and exophthalmic goitre excepted) which for this purpose are regarded as local diseases, and

(*b*) Thrush, undefined anæmia and chlorosis, chronic rheumatism and alcoholism, however stated, in view of the treatment of organic disease attributed to it which, for this purpose, rank below all except the ill-defined causes of death.

The general diseases are divided into four groups in order of their importance for the purpose of selection. Any disease in Group I. is to be selected in preference to any other not in Group I.; any in Group II. is to be preferred to any other not in Groups I. and II., and so on. If two or more of the diseases in any group are stated together the disease of longest duration or that first mentioned in the certificate, should as a rule be chosen.

*Group I.*—Small-pox, asiatic cholera, spirochætosis ictero-hæmorrhagica, acute poliomyelitis, encephalitis lethargica, meningococcal meningitis, epidemic hiccough, glanders, anthrax, rabies, tetanus, cancer (all forms), chronic poisonings by mineral and organic substances, strangulated hernia and acute intestinal obstruction, puerperal sepsis, puerperal phlegmasia alba dolens not returned as septic, and other diseases of exceptional interest when occurring in this country, such as Mediterranean fever, plague, yellow fever, leprosy, kala-azar, trypanosomiasis, pellagra, beri-beri, &c.

*Group II.*—Enteric fever, typhus, relapsing fever (*Spirillum Obermeieri*), malaria, measles, scarlet fever, whooping-cough, diphtheria, dysentery.

*Group III.*—Influenza, mycoses (except thrush), tuberculosis (all forms), venereal diseases, rheumatic fever, diseases of the adrenals, tabes dorsalis (locomotor ataxy), general paralysis of the insane, aneurysm.

*Group IV.*—Mumps, erysipelas, German measles, varicella, purulent infection, septicæmia, chronic arthritis, rheumatoid arthritis, osteo-arthritis, gout, scurvy, rickets, diabetes, pernicious anæmia, diseases of the pituitary gland, exophthalmic goitre, leukæmia, lymphadenoma, other general diseases.

If one of the causes mentioned is an immediate and frequent complication of another, the primary disease should be preferred to its complication. Some special rules apply to the headings congenital malformations, icterus neonatorum, premature birth, injury at birth, "other diseases peculiar to early infancy." Under 3 months: these conditions are to be preferred to any disease except syphilis and the diseases in Groups I. and II. Over 3 months: any definite disease not presumably the consequence of a congenital defect is to be preferred to these conditions. Premature birth is to be preferred to the other conditions enumerated. At the other end of life, congenital debility and sclerema and senile decay are to be treated as ill-defined causes of death. Lack of care is to be treated for this purpose as a form of violence. Senile dementia is to be treated in the same manner as other forms of insanity.

*Local Diseases.*—The following are to be selected in preference to any other local diseases except tabes dorsalis (locomotor ataxy), general paralysis of the insane, aneurysm, strangulated hernia and acute intestinal obstruction and puerperal sepsis, phlegmasia alba dolens not returned as septic.

(*a*) Malignant endocarditis, lobar pneumonia, infective enteritis and synonyms, parasitic diseases (except thrush), appendicitis, carbuncle, boil, cellulitis.

(*b*) Other diseases of the spinal cord, other forms of insanity, epilepsy, idiocy, imbecility, cerebral tumour, disseminated sclerosis, paralysis agitans, senile dementia.

A disease in (*a*) is to be preferred to any disease in (*b*). Where two or more local diseases, neither of which is included in the preceding list, are certified

together, that of longest duration should be preferred: if duration is not recorded any disease of a chronic nature should be preferred to a disease not so characterised; if neither disease can be assumed to be chronic, the first mentioned on a *medical* certificate should be selected. Exceptions to this rule are as follows. Any definite disease of the heart or kidney is to be preferred to any disease of the respiratory system. "Congestion" of any organ, convulsions (non-puerperal), "hæmorrhage" without stated cause, laryngismus stridulus, and dyspepsia rank below all except the ill-defined causes of death. Arterio-sclerosis, heart diseases, cirrhosis of the liver and chronic nephritis (including unspecified over 10 years of age) are to be preferred to cerebral hæmorrhage, apoplexy, &c., and hemiplegia which on the other hand are to be preferred to bronchitis. Broncho-pneumonia, and pneumonia not otherwise defined, are to be preferred to bronchitis. In the case of deaths occurring in mental institutions, nervous diseases are to be preferred to other local diseases, except those receiving special preference.

### *Simpler Procedure in Scotland.*

In Scotland the rules are of a simpler character. Preferences are to be applied in the order named and no one to be applied unless those preceding it are found inapplicable. These preferences are as follows:

1. Violence, except (*a*) trivial injuries combined with tetanus, erysipelas or septicæmia, (*b*) injuries received in epileptic or apoplectic fits, and (*c*) deaths from anæsthetics during surgical operations.
2. Infectious diseases, those of very low case mortality, such as chicken-pox, excepted.
3. Diseases and accidents of pregnancy and parturition.
4. More fatal diseases, such as cancer, tubercle, diabetes, Bright's disease, aneurysm, strangulated hernia, and intestinal obstruction. Pneumonia to be preferred to bronchitis.
5. A disease which is primary to one which is secondary. Thus valvular heart disease is to be preferred to congestion of the lungs, pneumonia to meningitis, and many diseases to diarrhœa.
6. Acute diseases are to be preferred to chronic.
7. A disease named in the list of Causes of Death is to be preferred to one not so named but included in a general heading (e.g., Other Diseases of the Respiratory System).
8. If none of the above preferences apply, the cause named by the certifier as primary is to be taken.

## FILLING-UP THE CERTIFICATE.

The manual makes a number of suggestions to medical practitioners respecting certificates of causes of death. It is regarded as highly desirable that medical practitioners should use in their certificates of death only those terms which are recognised in the nomenclature of the Royal College of Physicians of London. When this is done, no difficulty is met with, generally speaking, in referring deaths to their proper heading in the International List of Causes of Death, as now adopted for use in the Registrar-General's Reports.

### *Suggestions to Medical Practitioners.*

An alphabetical list is appended of unauthorised and indefinite or otherwise *undesirable terms* more or less commonly used in death certification, with comments indicating how the term is objectionable and what further information as to the cause of death is required in each case. Some of these terms are in themselves objectionable as descriptive of the cause of any individual death, while others require to be supplemented in the manner indicated. A few unobjectionable terms are included in the list for special reasons. This list is intended for reference only, and it is hoped that it will be consulted by certifying practitioners in any case in which they are not assured that the term used by them is included in the nomenclature of the Royal College of Physicians.

From the list of unauthorised or indefinite terms at present used on death certificates the following are selected from 133 examples given by the Registrar-General. Suggestions of a similar character are issued to medical practitioners in Scotland.

### *Examples of Undesirable Terms.*

| Ref. No. | Indefinite or undesirable term.* | Further information required (if available), and notes on the use of certain terms. |
|---|---|---|
| 1 | Abscess. | State cause (especially whether tuberculosis) and situation. |
| 6 | Aortitis, arteritis, endarteritis. | Was the condition due to syphilis? (If so, see No. 118.) |
| 10 | Blood poisoning. | Variety of toxic condition present (pyæmia, septicæmia, &c.), and cause of this condition. |
| 13 | Cachexia. | Disease causing this condition. |
| 21 | Catarrh— | Term best avoided if possible. |
| 22 | of bowels | Taken as equivalent to— Diarrhœa.† |
| 23 | of lungs | Taken as equivalent to— Bronchitis.† |
| 24 | of stomach | Taken as equivalent to— Gastritis.† |
| 27 | Cerebro-spinal meningitis. | Cause of this condition. Always certify "epidemic cerebro-spinal meningitis" or "cerebro-spinal fever," if this disease is meant. |
| 28 | Childbirth. | How this physiological process caused death. |
| 29 | Cirrhosis of liver. | Cause of this condition. |
| 33 | Congestion of brain, kidney, liver, or other organ. | If the disease amounted to an inflammation, use the appropriate term (lobar- or broncho-pneumonia, acute or chronic nephritis, &c.). Merely passive congestion should not be reported as a cause of death when the primary disease can be ascertained. a cause of death when the primary |
| 35 | Croup. | Disease causing this condition, as diphtheria, laryngitis, laryngismus stridulus, &c. Avoid using the word croup at all. |
| 43 | Diarrhœa. | Avoid certifying under this head in cases where the diarrhœa was merely symptomatic. |
| 48 | Eclampsia. | Disease causing this condition. Was it puerperal? |
| 57 | General paralysis, paresis. | If generaly paralysis of the insane is meant add the words "of the insane," and in all other cases indicate the disease causing the condition. |
| 59 | Growth, new growth, tumour. | Situation and nature of growth, if known. If not known, add "nature unknown." |
| 61 | Hæmoptysis. | Disease causing this condition. Was it a case of tuberculous phthisis? |
| 72 | Lumbar abscess. | Cause and site of origin. Was it tuberculous? |
| 73 | Malignant disease. | Taken as equivalent to cancer. The word malignant should never be used in reference to any other disease, when such use may cause confusion with cancer. |
| 82 | Nephritis. | Acute or chronic? Was it associated with pregnancy? Did it result from scarlet fever or any other disease? |
| 89 | Papilloma of bladder. | This tumour is listed under benign tumours by the Royal College of Physicians, and should not be applied to villous carcinoma. |
| 99 | Phthisis. | Avoid using this term without qualification as to nature. Always state whether tuberculous. |
| 104 | Pneumothorax. | Disease causing this condition. |
| 106 | Puerperal fever. | Avoid the use of this indefinite term by stating the form of puerperal infection.—e.g., puerperal pyæmia, puerperal septicæmia, puerperal septic intoxication, puerperal phlebitis, &c. |
| 110 | Rheumatic arthritis. | Always state whether acute, subacute, or chronic. |
| 111 | Rheumatism. | |
| 112 | Rodent ulcer. | Position of ulcer. |
| 113 | Rubeola. | Term best avoided, as it is used for both measles and German measles. |
| 117 | Softening of brain. | Cause of this condition (embolism, &c.). The term should not be applied to senile dementia nor to general paralysis of the insane. |
| 118 | Specific disease. | The word "specific" will always be understood in the sense of syphilitic. |
| 125 | Teething. | Disease causing death. |
| 130 | Uræmia. | Cause of uræmia. Was it due to puerperal, post-scarlatinal, or other acute nephritis, chronic Bright's disease, &c.? |

* When used without further particulars indicated in Col. 3.
† The alternative form of statement is much to be preferred.

In cases where an indefinite term has to be employed because more definite information is lacking it would be well to indicate this fact in the certificate. The word *idiopathic* will be understood as indicating that the probable cause of the condition stated is unknown—e.g., idiopathic atrophy, idiopathic convulsions, idiopathic peritonitis, &c.

*Primary and Secondary Causes.*

By *primary cause of death* is meant (in the case of deaths from disease) the disease, present at the time of death, which initiated the train of events leading thereto, and *not* a mere secondary, contributory, or immediate cause, or a terminal condition or mode of death. Acute specific diseases, if of recent occurrence, are to be considered the primary cause of death, even though the actual disease, as tested by power of infection, be no longer present at the time of death—e.g., measles (primary) 12 days; bronchopneumonia (secondary) 6 days. In the case of deaths from cancer the seat of primary growth, even if this has been removed, should be stated if possible.

A *terminal condition* or *mode of death* should not be entered as a secondary—i.e., contributory—cause. In a very large proportion of instances the statement of the primary cause gives all the information required; in these cases nothing is gained by adding as a secondary cause such a condition as syncope, heart failure, coma, exhaustion, &c. Thus a certificate of pulmonary tuberculosis is not improved by addition of "exhaustion" as a secondary cause, though if a complication such as "pneumothorax" had supervened this should be noted as a contributory cause of death.

In all cases "Yes" or "No" should be entered in the column headed *Post mortem* on the certificate.

The Registrar-General will always be grateful to receive direct communications containing *information* as to causes of death which was not available when the certificate was issued. These should be addressed to the Registrar-General, General Register Office, Somerset House, London, W.C.2, and require no stamp. Such information will not be incorporated in the record of the certificate, but will often be of the utmost value for statistical purposes. If this course were adopted when the precise cause of death can be stated (in the light, for instance, of a post-mortem examination or of a microscopic or bacteriological investigation), many indefinite certificates could be correctly classified.

*Some Special Causes.*

In addition to the foregoing general considerations, the following points as to special causes of death call for attention:—

(*a*) *Small-pox.*—In certifying a death from small-pox, the patient's condition with respect to vaccination should be carefully stated—say, in one or other of the following forms: (1) No evidence of vaccination; (2) vaccinated in infancy only—number of scars; (3) vaccinated only after infection by small-pox; (4) stated to have been vaccinated, but no scars. (If the patient has been revaccinated, the date should be given when possible.)

(*b*) *Cancer.*—Attention is particularly directed to the request that the seat of primary occurrence should be returned in all cases where known.

(*c*) *Diarrhœa.*—When this is due to improper feeding, or to any kind of food infection, the fact should be mentioned in the certificate. The Royal College of Physicians having condemned the use of the terms *gastro-enteritis*, *muco-enteritis*, and *gastric catarrh* as alternatives for the authorised term "infective enteritis," it is hoped that the use of these italicised terms will be entirely discontinued.

(*d*) *Childbirth.*—Whenever parturition or miscarriage has been in any way a contributory cause of death, the fact should be mentioned on the certificates. Always qualify all diseases resulting from childbirth or miscarriage as puerperal—e.g., puerperal septicæmia, puerperal peritonitis, &c.

(*e*) *Violence.*—The term violence is understood as including all deaths from unnatural causes (including anæsthetics and poisons of all forms), whether accidental, suicidal, or homicidal. It is rarely the duty of medical practitioners to issue certificates in the case of deaths from recently sustained violence, but it must be borne in mind that if a coroner declines to hold an inquest upon such a death a medical practitioner who has attended the deceased is bound by Section 20 of the Births and Deaths Registration Act, 1874, to give a certificate of the cause of death. When certifying deaths from violence which have not already been reported to the coroner (e.g., from paraplegia due to violence sustained many years before death), medical practitioners should advise the friends of the deceased to inform that official forthwith.

The following suggestions as to the form of certification of violent deaths are extracted from the Registrar-General's Circular to His Majesty's Coroners (1911):—

"In every case of death by violence or by suspected violence, whether the death resulted from the violence itself or from a pathological state induced by it, the verdict should state the form and means of violence, its accidental, suicidal, or homicidal nature, and the nature of the injury—e.g., fracture of skull (*nature of injury*) due to being *accidentally* run over (*form of violence*) by a motor-car (*means of violence*)."

(*f*) *Operation.*—In all cases where an operation has been performed for the disease or injury causing death, the operation, as well as the disease or injury for which it was performed, and any secondary conditions contributory to death and resultant from the operation, should be mentioned on the certificate. The interval between operation and death should also be recorded.

(*g*) *Anæsthetics.*—When death occurs during anæsthesia or is in any degree attributable thereto, the nature of the anæsthetic used should be recorded.

The body of the manual is occupied by a tabular list, under 205 headings, showing the terms included under each title of the detailed international list of causes of death as adapted for use in England and Wales, Scotland and Northern Ireland. An index to the tabular list and alphabetical list of terms used in the certification of the cause of death occupies pages 50 to 135 and will be found invaluable for reference.

## MEDICINE AND THE LAW.

*Anthrax: Brush Factory Worker's Death.*

A VERDICT of death from anthrax was recorded on Feb. 4th, at an inquest held upon the body of a boy employed in a Folkestone mop and brush factory. He had developed a boil at the back of his neck; this was followed by a swelling as large as a man's fist in the front of the throat. Subsequently, he was seized as with a fit; two doctors, called in just before he died, were unable to find the cause of illness. Evidence at the inquest was to the effect that cultures taken from the spleen and from the carbuncle showed a typical growth of the anthrax bacillus. The factory manager stated that the firm had obtained two lots of hair for making brushes. The first consignment was English and Chinese horsehair; there were pig-bristles also from China; a small portion of the Chinese hair was in an open box in the room where the boy worked. It was also stated that the factory premises were previously used as stables.

Parliament has dealt with anthrax at several points. In addition to the powers under the Diseases of Animals Acts, there is the Anthrax Prevention Act of 1919 and certain special provisions made departmentally under the Factory and Workshop Acts. The 1919 Act authorised the prevention by Order in Council of the importation into the United Kingdom of goods infected or likely to be infected with anthrax. The prohibition may be absolute or it may contain exceptions in favour of specified ports or be subject to specified conditions. An Order in Council may declare goods which are of any specified class or origin, or which are exported from or through any specified country or place, to be goods likely to be infected with anthrax. The first of these Orders prohibited the importation of Japanese shaving-brushes after Feb. 9th, 1920. Another, in 1920, declared the following to be goods likely to be infected with anthrax: All goat hair produced in or exported from or through India, all wool and animal hair produced in or exported from or through Egypt (including the Anglo-Egyptian Sudan), and all goods mixed therewith. Importation of these is restricted to the port of Liverpool, and is subject to conditions as to labelling, prior notification and delivery to the Government Wool Disinfecting Station in that port. Two years ago, in his book on "The Home Office," Sir Edward Troup wrote that this Liverpool Disinfecting Station, erected at a cost of £113,000, already pays its running expenses and gives excellent results.

He added that its operations, at present restricted to East India goat hair and Egyptian wool, ought soon to be extended to other infected materials. Factory and Workshops Acts Regulations of 1907 dealt with the handling of horsehair from China, Siberia, and Russia as a dangerous industry; they prescribed disinfectants, forbade anyone to work on non-disinfected horsehair with any open cut or sore, ordered cautionary notices about anthrax to be posted up on the premises, and contained the usual provisions about the wearing of overalls, the reporting of cuts and sores, washing, and restriction of keeping or eating food in rooms where such horsehair is stored or manipulated. Regulations of 1908 as to factories in which East Indian wool is used do not go quite so far, but the more recent Hides and Skins Regulations of 1921 are more elaborate. They relate to premises where are handled dry or dry-salted hides or skins imported from Africa (including Madagascar) or Asia (including Japan and the Malay Archipelago). A cautionary notice is to be posted, and first-aid boxes, special clothing, mess rooms and lavatories provided. Employees must report cuts and sores to their foreman and must not handle hides till their injury is treated. In the Folkestone case a factory inspector said he was satisfied that all regulations had been complied with. Anthrax is a scheduled industrial disease under the Workmen's Compensation Act for workers who have to handle wool, hair, bristles, hides and skins. Thus, if such a worker contracts it, the disease is deemed due to the nature of his employment unless the employer can prove the contrary.

*Verminous Insects in Turkish Baths.*

A plaintiff, who paid 5*s.* for spending a night in some Turkish baths in London, sued the proprietors for damages for personal injuries, alleging that he had been bitten by verminous insects. After hearing the evidence the judge was satisfied that the plaintiff had been bitten by bugs, that he had not been bitten before going to the baths, that he was bitten while in the baths, and that he had not himself carried the bugs there. The defendants argued that there was no implied warranty that the plaintiff should not be bitten and that there was no negligence on their part as they had taken all reasonable steps to keep their premises free from verminous insects. The judge, however, found them liable in law as well as in fact, and awarded £52 10*s.* damages with costs on the High Court scale. As a matter of contract, he considered, the defendants had impliedly agreed with the plaintiff that the premises were reasonably fit for use as Turkish baths and, incidentally, that the couches were reasonably fit to recline upon. The parties must have contemplated that the cubicles and couches should be free from bugs or other harmful insects. If there was this implied contract, it mattered nothing what steps the defendants had taken to render their premises fit; if the plaintiff was injured, it availed the defendants nothing, though they had taken every possible step. Apart from contract, the defendants owed the plaintiff a duty not to be negligent. The plaintiff was not a mere invitee, but a person who had paid money for the right to use the premises. If the premises were unfit and the defendants knew it, and allowed the plaintiff to use them without warning him of the danger, then the defendants would be liable if the plaintiff was thereby injured. The judge held that the proprietors of the Turkish baths knew of the danger (there was evidence of various complaints to the staff of the baths from other users) and allowed the plaintiff to use the premises without warning him. He held that the plaintiff had suffered damage to the extent already stated by reason of the breach of warranty and the negligence. Evidence was given at the trial to the effect that iron bedsteads had been substituted for wooden ones since the complaint had been made. The proprietors of Turkish baths will no doubt note this ruling as to their legal liability. At one point in the case it had been suggested that the bites were due to mosquitoes, but there was clear evidence to the contrary.

*Colonel Kynaston's Case: Summons Withdrawn.*

When proceedings were taken against Colonel Kynaston, late R.A.M.C., under the Dangerous Drugs Act, the gist of the charge was that he, not being then a registered medical practitioner, had prescribed powdered opium. A further summons was also taken out against him in connexion with the same transactions, charging him under the Medical Act with having unlawfully, wilfully, and falsely used the descriptions M.R.C.S. and L.R.C.P. Lond. When the prosecution secured his committal on the Dangerous Drugs Act and his conviction and punishment by fine at the Old Bailey, the Medical Act summons was not proceeded with, but was adjourned *sine die*. Subsequently, the Old Bailey conviction was quashed by the Court of Criminal Appeal on the ground that the charge had named the Dangerous Drugs Act of 1925, and that the 1925 Act was not yet in force, but the Medical Act summons remained outstanding. At Marlborough-street police-court on Feb. 7th the prosecution applied to the magistrate, Mr. Cancellor, for permission to withdraw the summons, which would not have pursued if the conviction had stood.

## THE CLOSING OF THE POST-GRADUATE HOSTEL.

A GENERAL meeting of the vice-presidents and supporters of the Post-Graduate Hostel was held at the Imperial Hotel on Monday, Jan. 31st. Sir D'ARCY POWER, President of the Hostel, was in the chair, and there was a very poor attendance.

The CHAIRMAN reported that the financial basis on which the Hostel had been built up had failed. It had been expected that post-graduates would patronise the Imperial Hotel and its branches and thereby supply the Hostel, through the discount to be allowed by the hotel proprietors to the Hostel, with the income necessary for the carrying on of the discussions and the social activities of the Hostel. The Hostel had now been in operation for six months and although the discussions had been successful the number of people lodging in the Hostel had been very few and the Executive was now faced with a deficit of about £60, which was likely to increase unless a new financial basis were found for future operations. He thought that probably the best way would be to bring the experiment to a close.

After some discussion it was proposed by Dr. ANDREW BALFOUR and seconded by Sir JAMES BERRY that the affairs of the Hostel be wound up. Both of them expressed their great reluctance in advocating this step, but they felt that the encouragement received was not sufficient to justify the Executive in continuing. It was probable that the locale of the Hostel had not been well chosen, and at any rate it was certain that any experiment of the kind ought to have behind it either a sufficient capital sum to provide a really satisfactory hostel or a moderate but certain annual income if a smaller experiment were to be tried. The present movement had neither of these.

Mr. MCADAM ECCLES supported the motion, which was carried. At the same time it was also resolved that a Committee, consisting of Sir D'Arcy Power, Dr. Andrew Balfour, Sir Thomas Horder, the Honorary Treasurer, and Dr. Cox be appointed to wind up the affairs of the Hostel. The proceedings closed with the cordial thanks of the meeting to Mr. A. P. Bertwistle, the Director of the Hostel, for the great trouble he had taken, and with a recognition of the success with which he had arranged interesting discussions.

Most of those present dined together, and afterwards there was a meeting, presided over by Sir Thomas Horder, unfortunately with a very small attendance, to hear an address from Sir Arthur Robinson, First Secretary of the Ministry of Health, on Our Duty to

Colonial Visitors. Sir Arthur Robinson gave a most interesting account of the activities of the Ministry of Health in connexion with the subject of post-graduate education, which came in the nature of a surprise to most of those present. He said it was unfortunate that his visit coincided with the closing down of the Hostel, but he felt sure that the effort had not been wasted and that the idea which had inspired the promoters of the Hostel could not die. The time would undoubtedly come when London would provide a post-graduate school worthy of it and an essential part of that school must be a hostel which would attend to the social side.

Those present passed a cordial vote of thanks for an address which the Chairman said had been really cheering on a depressing occasion.

# The Services.

## ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. W. H. Hastings is placed on the Retd. List at his own request with the rank of Surg.-Capt.

The following appointments are notified: Surg.-Comdrs.: J. P. Shorten to *Princess Margaret* (on relief), B. S. Robson to *Sandhurst* (temp. addl.), and J. C. Souter to *Princess Margaret* (temp.).

## ROYAL ARMY MEDICAL CORPS.

Col. J. W. H. Houghton, late R.A.M.C., retires on ret. pay.

Maj. W. E. C. Lunn retires on ret. pay and is granted the rank of Lt.-Col.

Capts. to be Majs.: H. A. Sandiford, W. D. Anderton, C. M. Foster (Prov.), H. R. Sheppard (Prov.), and D. W. Beamish (Prov.).

Capt. D. W. M. Mackenzie is restd. to the estabt.

Capt. A. Rodd is placed on the half-pay list on account of ill-health.

Lts. to be Capts.: W. B. F. Orr, F. J. O'Meara, and T. W. Davidson (who remains secd.).

### ARMY DENTAL CORPS.

Lt. B. Abbott to be Capt.

### ARMY RESERVE OF OFFICERS.

Lt.-Col. A. A. Seeds, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

Lt. A. Robertson to be Capt.

### TERRITORIAL ARMY.

*Hygiene Companies.*—Maj. J. H. P. Fraser resigns his commn. and is granted the rank of Lt.-Col. with permission to wear the prescribed uniform.

### TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt.-Col. J. F. Dixon, having attained the age limit, relinquishes his commn. and retains his rank.

Col. E. F. Buzzard, having attained the age limit, relinquishes his commn. and retains his rank.

### TERRITORIAL DECORATION.

The King has conferred the Territorial Decoration upon Majs. J. L. Hamilton and A. Morris, and upon Capt. G. B. Tait.

## ROYAL AIR FORCE.

Flight Lt. G. R. Nodwell is transferred to the Reserve, Class D.1.

Flying Officer V. P. Ellis (Temp. Lt., General List, Army, Dental Surgeon) relinquishes his temporary commission on completion of service.

## INDIAN MEDICAL SERVICES.

Capts. Bindeshwari Prasad, J. M. Mitchell, Codanda Madiah Ganapathy, and Nariman Jamshedji Gai to be Majs.

Venkatachari Srinivasan and Hari Narain Gupta to be Temp. Lts.

Col. A. A. Gibbs to be Maj.-Gen., vice Maj.-Gen. W. H. Ogilvie, appointed Director, Indian Medical Service. Capt. L. K. Ledger is posted as Medical Officer and ex-officio Vice-Consul, Sistan. The following are granted leave: Col. A. W. R. Cochrane, Inspector-General of Civil Hospitals, United Provinces; Majs. R. Hay and E. W. Og Kirwan, Civil Surgeon, Mymensingh.

## DEATHS IN THE SERVICES.

Fleet-Surg. John Bellhouse Bowden Triggs, R.N. (retd.), who died in a nursing home at Malden, Surrey, on Feb. 1st, aged 75, graduated in medicine and surgery at Aberdeen University in 1873 and obtained the M.R.C.S. Eng. in the following year. He served during the Zulu War of 1879 in medical charge of H.M.S. *Active* and in the Venezuelan revolution of 1891–92 (medal and diploma from the Venezuelan Red Cross Society for his services to the wounded).

## INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 29TH, 1927.

*Notifications.*—The following cases of infectious disease were notified during the week: Small-pox, 532 (last week 558); scarlet fever, 1500; diphtheria, 1030; enteric fever, 31; pneumonia, 2618; puerperal fever, 45; puerperal pyrexia, 176; cerebro-spinal fever, 13; acute poliomyelitis, 14; acute polio-encephalitis, 3; encephalitis lethargica, 26; dysentery, 11; ophthalmia neonatorum, 108. There was no case of cholera, plague, or typhus fever notified during the week.

The cases of small-pox were reported from the same counties as last week, with the addition of one case from Chester (Stockport), and one from Essex (West Ham).

*Deaths.*—In the aggregate of great towns, including London, there was no death from small-pox, 2 (1) from enteric fever, 50 (1) from measles, 6 (2) from scarlet fever, 101 (38 from whooping-cough, 43 (7) from diphtheria, 44 (12) from diarrhœa and enteritis under 2 years, and 725 (252) from influenza. The figures in parentheses are those for London itself. The influenza deaths for the last six weeks have thus been 69, 86, 173, 326, 470, and 725, while 818 is the figure notified for the week ending Feb. 5th, the deaths in London being 215.

## INFLUENZA IN SCOTLAND.

THE Scottish Board of Health states that up to Saturday last there was in most parts of Scotland no undue prevalence of influenza for the time of the year and nothing in the nature of an epidemic. There was, however, a good deal of influenza of a mild catarrhal type, and in some places—Aberdeen, Greenock, Falkirk, and the Lower Ward of Lanarkshire—it had increased since the previous week. At Aberdeen about 3 per cent. of persons visited by health visitors were found to have influenza and about 60 per cent. of health insurance sickness benefit claims had reference to influenza cases. In many other places there were fewer cases than in the previous week. In Motherwell and Wishaw the type was reported to be becoming milder, and the interesting distinction previously reported by the medical officer of health that the symptoms of the Wishaw cases were mainly gastric and those of the Motherwell cases catarrhal was becoming less marked.

ROYAL WEST SUSSEX HOSPITAL.—A centenary fund has been inaugurated, and plans involving an outlay of £30,069 have been agreed upon for improvements. Founded in 1784 as a dispensary for the relief of the sick poor, this institution became a hospital in 1793 and was established in 1826 as the Chichester Infirmary. As it met the increasing needs of the district it came to be known as the West Sussex, East Hants, and Chichester General Infirmary and Dispensary, and afterwards the word "infirmary" was deleted and "hospital" substituted. King Edward frequently visited the hospital on his way from Goodwood to Cowes, and in 1912–13 the hospital was entirely renovated and reconstructed as a lasting memorial to him. When on August 2nd, 1913, King George reopened the building, he acceded to the request that it should be known as the Royal West Sussex Hospital. Nearly 1200 in-patients and three times that number of out-patients are nowadays treated yearly. At the annual meeting in April, 1926, a contributory scheme was launched, and although it did not come into operation until November the number of contributors by the end of the year was over 5500, representing an income of over £2000 a year. The success of this scheme seems thus assured, and already there has been a very encouraging response to the centenary appeal. The new improvements to the hospital are to be associated with the name of the late Dr. David Ewart.

# Obituary.

## THOMAS ROBERT BRADSHAW, M.D. DUB., F.R.C.P. LOND.

AFTER a long illness, Dr. T. R. Bradshaw died on Jan. 25th at his home at Mold in North Wales, where he had lived since retiring from practice. During the many years of his association with Liverpool hospitals he was recognised as a physician of real merit, who brought to his work high qualities of mind and character.

DR. T. R. BRADSHAW.

Born at Leamington in 1857, Thomas Robert Bradshaw was the son of John W. Bradshaw, solicitor, of Dublin, and was educated in Dublin at the Rathmines Hospital, and later at Trinity College. He graduated M.D. in 1882, and later became M.R.C.S. Eng. after a term of study at University College, London. His final settlement in Liverpool was largely due to the fact that his relative, the late Dr. T. H. Waters, was at this time physician to the Royal Infirmary and professor of medicine at University College in that city. He first served as house physician and house surgeon at the Infirmary and at the Northern Hospital, and was then elected successively to the honorary staff of the Stanley Hospital, the Northern Hospital, and the Royal Infirmary. This last appointment he held for 16 years. In 1904 he was made a Fellow of the Royal College of Physicians of London.

Dr. Bradshaw wrote much on medical topics, most of his papers appearing in the Liverpool medical journals. The contributions to medicine which brought him most renown were, perhaps, those dealing with the morbid anatomy and pathology of myelopathic albumosuria. The first observer in the English-speaking world (1897) to describe multiple myelomata occurring in conjunction with Bence-Jones albumose in the urine, he was also the first to diagnose the condition correctly during life, and was responsible for the hydrochloric acid test by which the protein is detected. His other communications dealt with subjects so widely diverse as cardiac murmurs, affections of the bronchi (on which he wrote for Quain's "Dictionary of Medicine"), the behaviour of litmus in amphoteric solutions, Addison's disease, and various neurological conditions. He became lecturer in clinical medicine in the University of Liverpool and at one time examined for the University of London. In 1910 the Liverpool Medical Institution elected him president. In all his work there was evidence of literary taste as well as careful preparation and wide reading. One of his chief interests was ecclesiastical architecture, which he studied by taking excellent photographs.

During the late war Dr. Bradshaw worked for the First Western General Hospital. He married in 1904 Rose Mary, eldest daughter of Dr. T. R. Glynn, then professor of medicine in the University of Liverpool. His widow survives him.

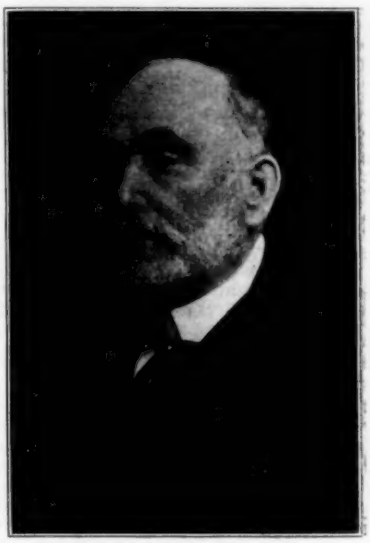
## JOSEPH JACKSON LISTER, F.R.S.

Mr. Joseph Jackson Lister, who died on Feb. 5th at his house in Cambridge, was a nephew of Lord Lister, and son of Arthur Lister, the distinguished botanist. He was born in 1857, and was educated at St. John's College, Cambridge, of which foundation he was a Fellow, and formed one of the group of young zoologists which made the Cambridge school of science famous 40 years ago, to the immense benefit also of the school of medicine. He was elected F.R.S. in 1900 for his studies of the foraminifera, but his work was so much interfered with by his health that his qualities were little known outside an immediate circle; but within that circle he enjoyed, and rightly, a high reputation both as man of science, writer, and colleague.

## JOHN HEDLEY, M.D.DURH., L.S.A., J.P.

Dr. John Hedley, who died suddenly in London on Friday of last week of a heart attack, at the house of his son-in-law, Mr. Douglas Harmer, at the age of 84 years, had been the whole of his long life in general practice in Middlesbrough, of which he was a worthy citizen.

John Hedley was born at Ovingham, Northumberland, the youngest son of William Hedley, and was educated privately at Stamfordham. His father died when he was a boy, and at the age of 15 years he was apprenticed to Dr. James Aitchison, of Wallsend, taking at the same time a course at the Newcastle Medical School, from which he qualified M.R.C.S. in 1864 and L.S.A. in 1865. In the following year he began to practise in the town, which was then little more than a large village, and, with the exception of a visit to France with the Red Cross in 1871 when he witnessed the surrender of Strasbourg, he practised continuously in Middlesbrough until his final retirement in 1918. He was soon appointed surgeon to the North Riding Infirmary and built up a large general practice on Tees-side, often acting in a semi-official capacity as medical referee in compensation cases, when his awards were accepted without demur, as he was trusted by both sides. He was himself certifying factory surgeon for the district, only retiring from that post in his eighty-second year after an accidental fracture of his pelvis. He assisted in a Home Office investigation into the epidemics of pneumonia in Middlesbrough, and contributed an article to Oliver's "Industrial Diseases." After deciding in July, 1914, to retire from active practice and enjoy some well-earned leisure, he resumed his work again in November of that year, after war had broken out, in order to release his successor for active service.



DR. JOHN HEDLEY.

He joined the Middlesbrough Town Council in 1886, was elected mayor in 1902, and held the office of alderman until two years ago. He took the

liveliest interest in all that concerned the life of the town, became justice of the peace for the borough and county, a member of the Tees Conservancy Commission, served on insurance and education committees, and presided over the Committee of Selection for Magistrates.

In 1873 Dr. Hedley married May, elder daughter of Mr. Edward Williams, then manager of Messrs. Bolckow, Vaughan and Co., and with his wife's help he started soon after a nursing service for the workmen in the employment of her family, which developed later into the nursing association serving the town and district, one of the first of its kind in the country. To the end of his life Dr. Hedley retained the power of absorbing new ideas and applying them to practice; he was far in advance of his time in such matters as surgical cleanliness and the open-air treatment of disease, and to the end he kept in touch with the new medical knowledge of the time. His wife predeceased him by two years. Of his eight children, all of whom are living, two sons are in the medical profession and his two daughters married medical men.

His funeral service was attended by the principal citizens of the county borough for which he had done so much, and which recognised that with his character and ability he might reasonably have aspired to a more imposing reputation on a wider stage. But he was content to begin and carry through to the end innumerable tasks which were of real service to the people among whom he lived.

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## FRANCIS SORELL ARNOLD, M.B., B.CH. OXF.

WE regret to announce the death on Feb. 5th, at Painswick, Glos., of Dr. F. S. Arnold, after a short illness. He was born in Dublin, grandson of Thomas Arnold, the famous Rugby headmaster; son of Thomas Arnold, the author of the well-known Manual of English Literature, and brother of Mrs. Humphry Ward. He was educated at Clifton, entering Christchurch, Oxford, with a junior studentship in 1879, and graduating there in natural science four years later. He took his medical degrees in 1887, after spending four years at St. Bartholomew's Hospital, and was for a time house surgeon at the Radcliffe Infirmary before taking up general practice. For a period of seven years he was medical superintendent to the Hailey Open-air Sanatorium, utilising his experience there for a book on the "Modern Therapeutics of Pulmonary Phthisis." At Oxford he developed the polyglot capacity which stood him in good stead throughout his life, for he translated many foreign classics, and was equally at home with the Dutch, German, Spanish, and Italian languages. The list of authors who owed him their introduction to English medicine is a long one, and includes the names of Bing, Schlesinger, and Guelpa. In past years THE LANCET has often been grateful to him for service of this kind. More recently his professional life was spent at Berkhamsted, Bovingdon (Herts), and Painswick, where he was medical officer to a District Union and to the Guide Orphanage. He married Annie, daughter of the late T. R. Wilkinson, who survives him. By his death the medical profession loses a cultured member of many-sided interests.

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## ROBERT WILLIAM FELKIN, M.D. MARBURG, L.R.C.P., F.R.S. EDIN.

WE regret to record the death of Dr. Robert William Felkin, a well-known student of tropical disease, which occurred at Whare Ra, near Hawke's Bay, New Zealand, on Dec. 28th last. Felkin was a Nottingham man and was educated at Wolverhampton. He became interested at an early age from the religious point of view in the problems of anthropology and geography of disease, probably because he met Livingstone during childhood, and was much impressed by the career of that great medical missionary. He received his medical education at Edinburgh, where he took the double qualification of the Royal Colleges. He later obtained the medical degree of the University of Marburg, and shortly afterwards went with Stanley's expedition for the relief of Emin Pasha. The life of that German traveller, physician and administrator, as written by G. Schneitzer, was introduced to English readers by Felkin, and it was easy to see that Africa possessed already a strong hold on his imagination. He proceeded to Uganda, where he filled for some time the anxious post of medical advisor to a native king, but finding little opening there for either his talents or his aspirations, he returned to England and worked at tropical diseases, the importance of whose study had now become manifest, though most of the modern pathology was still in the making. Between 1890 and 1900 he made various visits to Africa, the results of which he published in a work entitled the "Geographical Distribution of Tropical Disease," and he made many scientific communications to medical journals. During this period he was an occasional though fairly frequent correspondent of THE LANCET, both advising us when he was at home and communicating with us when he was abroad; but the greater part of his signed writing will be found in the *Balneological and Climatological Journal*. For a period he lectured on tropical diseases in Edinburgh, and acted in a consulting capacity to the British Tropical Africa Company. His health had been severely tried by his extensive travels, and after a definite breakdown he decided to reside permanently in New Zealand, where he passed the last 12 years of his life.

Dr. Felkin, though his name will always be associated with tropical disease, was a man of wide interests and knowledge. He was a considerable anthropologist and a member of several foreign academies; he wrote on such various subjects as monism, heredity, and psychotherapeutics, and contributed papers to German and English publications on popular errors in medicine, on folk-lore, and on spa treatment.

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## LLEWELLYN POWELL PHILLIPS, M.D. CAMB., F.R.C.S. ENG., F.R.C.P. LOND.

Dr. Llewellyn Powell Phillips, who died recently in Cairo at the age of 55, was the son of a Cardigan physician, and was educated at Epsom and Caius College, Cambridge. He obtained first-class honours in the natural science tripos of 1892, and went on to St. Bartholomew's Hospital, graduating in medicine at Cambridge in 1895 and taking the F.R.C.S. Eng. in 1897. After filling various residential posts at St. Bartholomew's he proceeded to Egypt as resident surgical officer at the Kasr el Aini Hospital, with which institution he was connected for 24 years as professor of clinical medicine in the school and senior physician to the hospital, his retirement from government service only taking place two years ago. In 1909 he was elected F.R.C.P.

Dr. Phillips was well known to all members of the medical profession whose business, or, indeed, whose pleasure, brought them into any relation with Egypt, and especially with Cairo. He had a large practice both among Europeans and natives, for his energetic work done during a cholera epidemic in 1901 had secured for him the admiration of all the community. During the war he acted as commandant of a British Red Cross hospital at Giza, where his wife acted as matron, and for his services he received honours both in the Medjidieh and Nile Orders.

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THE LATE DR. A. C. ELLIOTT.—The death is reported of Dr. Arthur Campbell Elliott, who had practised at St. Annes-on-the-Sea, Lancashire, for 32 years. Dr. Elliott, who was 61 years of age, graduated at the University of Edinburgh in 1891 and served as house surgeon at the Preston Royal Infirmary. On entering general practice he became police surgeon for the St. Anne's area and was medical officer to convalescent homes in the district. There was a large gathering at the funeral on Jan. 29th.

# Correspondence.

"Audi alteram partem."

## DEATHS UNDER ANÆSTHETICS.

*To the Editor of* THE LANCET.

SIR,—In your issue of Jan. 22nd Dr. A. G. Levy adopts methods of deductive reasoning that cannot be passed by without comment. He assumes that a certain anæsthetic (ether) is safe; and this is reasonable enough, for it is commonly reputed to be so, and Dr. Levy himself has in the past done much valuable work on the dangers of its principal competitor. He collects from the Registrar-General the mortality due to its use and the mortality due to other anæsthetics, and finds that the statistical facts thus obtained do not bear out the theory of the almost fool-proof innocuousness of ether.

What, then, is his next step? To revise or reconsider the theory until it fits the facts? No. With sublime simplicity he alters the facts to fit the theory. The total yearly number of anæsthetic deaths has risen from 276 in 1911 to 446 in 1923, a rise of about 61 per cent. Part of this rise is accounted for by the ever-increasing number of operations. (The author estimates from the theatre statistics of a large hospital that this increase during the same period amounts to 13 per cent.) The casualty list yields the following information: chloroform deaths dropped from 66 per cent. to 22 per cent. Mixture deaths rose from 22 per cent. to 37 per cent. Ether deaths rose from 9 per cent. to 32 per cent.—this in spite of the increased popularity of the open ether method. In 1923, 123 deaths occurred from the use of ether alone; their records were examined and they were found to be mainly routine cases. Many of them were trivial, and there was no undue preponderance of excessively severe operations which might fictitiously swell the total.

But Dr. Levy's explanation of the rise in the number of deaths due to ether is that they are not in fact deaths due to ether at all. He states that, owing to the slowness of open ether induction, chloroform or a mixture is often used at first, followed by open ether. The administration is described as ether, mention of the preceding and possibly brief use of chloroform being omitted. Very likely this is so in some cases, but there is no proof that all or even many of the figures are inaccurate. As far as I can judge of the accuracy of the certification, the fact that the highest percentage of deaths is certified as due to mixtures inclines me to the belief that when a mixture is used the fact is revealed. The conclusion drawn at the end of the article is that the reports of the Registrar-General prove that diluted chloroform or a small amount of chloroform at the commencement of the induction is dangerous.

It may be so, but I cannot see how these figures, showing 32 per cent. of ether deaths to 22 per cent. of chloroform deaths prove it. It would surely be more rational, on finding facts that conflict with a theory, to re-examine the theory with a critical eye. Points worthy of investigation are (*a*) is ether so intrinsically innocuous as it is thought to be? (*b*) What is the effect of faulty or unskilled administration? (*c*) What is the effect of its use in unsuitable cases, under the belief that the (generally) safest drug is always the safest?

I have been much interested in this subject for several years, during which the impression has been gradually gaining ground in my mind that ether is more toxic and even more lethal than is usually thought. In order to test this hypothesis I have investigated a series of 30,000 cases, an analysis of which is at present in the hands of the publishers. The results, as I interpret them, show very clearly that by far the most important factor in the mortality-rate was the care taken in the administration. 10,000 cases from one hospital were compared with 20,000 from another. One hospital used chloroform freely (in 27 per cent. of cases), even in closed inhalers, but insisted on skilled administration on all occasions. The other hospital was chloroformophobic and nearly 95 per cent. of its patients received ether alone. Relying on the belief that ether is an innocuous drug anæsthetics were administered in many cases by unsupervised dressers. The ether enthusiasts had a much higher mortality, both immediate and remote, than the careful chloroformophils, their deaths on the table being double and their remote mortality 23 times as great.

While not attempting to attack the impregnable doctrine that ether is in general safer than chloroform, I do put forward the view that ether in unskilled hands is never fool-proof and may sometimes be dangerous. Personally, I would far rather have chloroform administered to me by an expert than ether by a novice.

I am, Sir, yours faithfully,

W. STANLEY SYKES.

Morley, near Leeds, Feb. 7th, 1927.

## THE FINGER-PRINTS OF IDENTICAL TWINS.

*To the Editor of* THE LANCET.

SIR,—In an annotation last week you referred to the close similarity, without actual identity, of the finger-prints in a pair of identical male twins described by Dr. G. P. Crowden in the Guy's Hospital Reports. I went into this very point most carefully in a clinical lecture on Congenital Defects of the Long Bones, delivered in 1925 at Manchester University and printed in the *Journal of Bone and Joint Surgery* for July, 1925. It happened the identical twins there described were so similar that they reproduced a deformity—namely, absence of the tibia, shown by Hoffa's observations to be exceedingly rare. I therefore regarded my twins as especially similar—perhaps the most identical ever produced. Their finger-prints were taken as "probably identical," but the Scotland Yard Department quickly found differences, and established clearly their argument that no two impressions are alike. I am, Sir, yours faithfully,

Manchester, Feb. 7th, 1927. ROBERT OLLERENSHAW.

## IS THE PRESENT EPIDEMIC OF INFLUENZA DUE TO A STREPTOCOCCUS?

*To the Editor of* THE LANCET.

SIR,—In your issue of Jan. 29th Drs. David and Robert Thomson have drawn attention to what they term an unusual streptococcus of a highly pleomorphic character. This organism was isolated from a case of apparently true influenza, and they suggest that the attack was caused by it. May I point out that this pleomorphous streptococcus is not by any means a novelty? During the pandemic period of 1918-19 I was able to isolate this interesting organism from practically every case examined by me in Reading. The brothers Thomson will find a brief description of the streptococcus in THE LANCET for 1918 (vol. ii., p. 722) and for 1919 (vol. i, p. 280). If they care, further, to refer to my article on the Bacteriology of Influenza in Dr. F. G. Crookshank's "Influenza: Essays by Several Authors" (published by Messrs. Heinemann), they will find there references to papers from the pen of other bacteriologists dealing with an apparently similar organism. Whether it is the chief organismal factor in the causation of influenza is another matter. It may have no more claim to be so regarded than has Pfeiffer's bacillus, wrongly called the *Bacillus influenzæ*.—I am, Sir, yours faithfully,

ROBERT DONALDSON.

St. George's Hospital, Feb. 2nd, 1927.

*To the Editor of* THE LANCET.

SIR,—Drs. David and Robert Thomson state that they have obtained cultures of a streptococcus from one of themselves who was suffering from influenza. In this connexion it may be helpful to note that in

1919, on page 68 of his monograph entitled "Die Spanische Grippe und ihre Bekämpfung" (published by E. Bircher, Berne), Dr. Carl Spengler, of Davos, and formerly of the Koch Institute, described a streptococcus form of his "grippe bacillus," cultures of which he obtained from cases of influenza. Drawings of this streptococcus are shown in the plates at the end of Spengler's monograph.

I am, Sir, yours faithfully,

WALTER H. FEARIS,
Late Bacteriologist to the City of Cardiff and County of Glamorgan Public Health Laboratory.

Brightlingsea, Feb. 2nd, 1927.

## THE ADRENAL BODIES AND THE SPLANCHNIC NERVE.

*To the Editor of* THE LANCET.

SIR,—It has been shown by Pearlman and Vincent, Sheen and Vincent and Vincent and Wright that, when the peripheral end of the splanchnic nerve (in an animal under ether anæsthesia) is stimulated, the blood-pressure curve obtained is not a simple one. The initial rise of blood pressure is followed by a "dip" succeeded by a return to a level exceeding the initial height of the blood pressure, which height is maintained so long as stimulation is continued. This dip does not recur after elimination of the adrenal bodies.

MacDonald and Schlapp have recently demonstrated that the well-known depressor effect of small doses of adrenin is not due to any reversal of the action of the drug in such doses, but solely to a pharmaco-dynamical influence of the ether employed as anæsthetic. This conclusion, if confirmed, removes at once one of the strongest arguments (frequently used by one of us) against the so-called "tonic" theory of adrenal activity. This is obviously a matter of great clinical and pathological importance. It is, therefore, satisfactory to record that we have been able fully to confirm the observations of MacDonald and Schlapp.

It was believed by the writers above-mentioned that the "dip" in the splanchnic blood pressure curve is due to the pouring out of small quantities of adrenin causing a temporary depression during the course of a vaso-constrictor elevation of blood pressure. The interesting discovery of MacDonald and Schlapp has rendered this hypothesis more secure. We find that the "dip" does not occur in an animal entirely free of anæsthetic. It is, then, a phenomenon dependent upon both adrenal secretion and the pharmaco-dynamical action of ether (and possibly other anæsthetics also). This has been confirmed in a large number of experiments upon pithed and decerebrate cats, and the uniform result has been that, when adrenin injected intravenously caused a vaso-dilatation, then and only then could we obtain the dip in the splanchnic curve.

We hope shortly to publish further details.

We are, Sir, yours faithfully,

SWALE VINCENT,
F. R. CURTIS.

Physiological Department, Middlesex Hospital Medical School, Feb. 8th, 1927.

## IMMUNITY TO IMPLANTED TUMOURS.

*To the Editor of* THE LANCET.

SIR,—Since my previous letter, Dr. Lumsden has kindly shown me his slides. There is now no doubt in my mind that he is dealing with carcinoma cells. In my opinion, the reason why they do not exhibit the usual appearance of growing in continuous sheets of cells is because they are not "healthy." These are more or less degenerated as evidenced by fatty degeneration of their cytoplasm and the beginning of nuclear pyknosis. Dr. Lumsden maintains that such cells will continue to exhibit evidence of vitality (for instance, movement) for some weeks; but when exposed to certain antisera degeneration proceeds at a greatly increased speed. In contrast to this "healthy" normal cells such as fibroblasts or kidney cells do not undergo this rapid degeneration. Though it may be fair to compare degenerating carcinoma cells with each other, it seems doubtful whether this can be done with advantage when degenerating carcinoma cells are contrasted with healthy cells.

I am, Sir, yours faithfully,

J. C. MOTTRAM.

The Radium Institute, Portland-place, London, W. 1, Feb. 2nd, 1927.

*To the Editor of* THE LANCET.

SIR,—In reply to Dr. Drew's letter the migrating cells mentioned in my letter in your issue of Jan. 29th as having given rise to cancer when inoculated into mice, were collected after removal of the fragment from which they emanated. They were injected alone in a small quantity of serum. The experiment is a delicate one, and it is obvious that the small number of cells inoculated after considerable interference should not be expected to cause a progressive tumour in every case. In three out of ten mice so inoculated a progressive and typical M63 tumour was produced, and this to my mind is alone sufficient proof that these migrating cells are malignant. I and others who have worked much with my medium and methods have no doubt at all on the point, and I think that only unfamiliarity with the results obtained could be the basis of the doubts existing in the minds of Dr. Mottram and Dr. Drew. A few further points confirmatory of my views may be worth setting down:—

1. Not infrequently both cancer cells and unmistakable stroma cells migrate out of a fragment of M63. Application of antihuman cancer serum kills every cancer cell and causes no damage to the stroma cells.

2. When a tiny fragment consisting of, say, 30 or 40 cancer cells is watched under the microscope these cells can be observed to wander out, and have exactly the same characters as those migrating out of a larger fragment.

3. Where fibroblasts from the heart or salivary gland or epithelium from the kidney are intermingled with these cancer cells, the latter only are killed by an antimalignant serum—e.g., from a rat hyperimmunised to J.R.S. See Figs. 3 and 4, in my paper in THE LANCET, 1926, ii., p. 112.

4. Fragments of M63 grown in normal serum invariably cause cancer when inoculated into mice. Fragments to which anti-M63 serum has been applied do not cause cancer.

5. The results obtained in the treatment of tumours in the living animal are confirmatory of the views I maintain, and are the fruit thereof.

I will gladly show Drs. Mottram and Drew actual specimens which I hope may convince them, but their repeating my experiments is the only certain means of doing so. In the belief that truth emerges more readily from experimental observation than from correspondence, I propose to continue the former and not the latter.

I am, Sir, yours faithfully,

THOMAS LUMSDEN.

Lister Institute of Preventive Medicine, London, S.W., Feb. 5th, 1927.

PS.—Since I wrote the above, with Miss A. C. Kohn-Speyer I showed some specimens to tissue culture-specialists and others at the meeting of the Biochemical Society on Feb. 7th. All were, I think, convinced of the malignant nature of the cells migrating from my cultures of mouse cancer. I am glad to state that after examining the specimens Dr. Mottram, with a candour worthy of his reputation, admitted the malignant nature of these cells, although I think he was not so convinced as, by long experience, I am, of their activity and power of resistance.

Dr. Drew, though invited, was unable to be present. In vitro tests give useful indications, but the conditions are necessarily abnormal and only results obtained in living animals are entirely convincing to my mind. My method consists in killing these cultured

cancer cells in a few minutes by applying an appropriate antiserum, while controls in normal serum migrate actively for 2–3 weeks. This is regarded as evidence that the antiserum tested was toxic.—T. L.

### TREATMENT OF TUBERCULOSIS BY MR. SPAHLINGER'S METHODS.

We have received a further letter from Mr. Spahlinger, in which he repeats that he did not allude to "serum" when certain cases were under treatment at St. George's Hospital, and states that he did not make the claims attributed to him for rapid results. He says the cases treated outside the hospital were visited with him by Dr. Linnell and Dr. Hunt, but that they were not Dr. Latham's cases, although they were seen by two of the staff of St. George's Hospital on behalf of Dr. Latham. Mr. Spahlinger acknowledges the amount of space already taken up by the controversy with gratitude and disclaims a desire for further polemics. Nothing in his letter alters the position as set out by the correspondence which appeared in our columns on Jan. 29th, 1927.

# Parliamentary Intelligence.

## NOTES ON CURRENT TOPICS.

OPENING OF SESSION—KING'S SPEECH.

THE new session of Parliament was opened by the King in State on Tuesday, Feb. 8th. In the course of the Speech from the Throne it was stated among the measures to be dealt with during the coming session would be a Bill to amend the law relating to industrial disputes; a Bill for the amendment of the law relating to leasehold premises, so as to secure to an outgoing tenant compensation for the loss of his good-will and unexhausted improvements; and Bills dealing with questions affecting agriculture and insurance against unemployment.

## HOUSE OF COMMONS.

TUESDAY, FEB. 8TH.

*Poor-Law Reform and the Factories Bill Postponed.*

Speaking in the debate on the Address in reply to the Speech from the Throne, Mr. BALDWIN, Prime Minister, said he thought that when the Speech was examined the House would see that there was a great deal of useful work that they might accomplish in the time at their disposal. The Government had only put into the Speech such legislation as they thought there was a reasonable prospect of carrying by August 1st. One measure of which the House had heard a good deal—namely, that dealing with Poor-law reform—was so large and comprehensive that it would have been impossible to take it this session unless they had contemplated a long autumn session. It was a measure which must be mixed up with very important and intricate questions of local finance. It was very important that such questions should not come before the House until they had been examined from every point of view, and some opportunity had been taken of discussing them with local authorities. He hoped that it might be possible when the new Session started in November to move ahead with this important piece of work. The same was true of the Factories Bill.

MANCHESTER ROYAL INFIRMARY.—Plans have been approved for the erection in York-place of the new home for nurses and it is hoped that building will begin in a few months. The total sum received for this purpose is £58,401. The accommodation required in the new home shows that a total staff of 379 has to be housed, including 85 domestic servants. The number of cases treated in the accident room increased from 19,491 in 1922 to 26,347 in 1925, and 27,677 in 1926, the daily average of new casualty cases being just over 75. The ordinary income was £93,163, and the total ordinary expenditure £121,365. The deficits for the past three years have been—in 1924, £24,147; in 1925, £22,740; and in 1926, £18,082. The total number of patients treated rose from 57,499 in 1925, to 59,232 in 1926. There were 9657 operations performed. Owing to the coal dispute, the extra expenditure on coal during the year was £5000.

# Medical News.

UNIVERSITY OF OXFORD.—At a congregation held on Jan. 27th the following degrees were conferred:—

*Bachelor of Medicine.*—William Frederick Howson Ray, Richard Christie Hodges, Robert Illingworth, Charles Webley Hope-Gill, Thomas Mortimer Ling, George Eric Macdonald, Edward Mandeville Wright, William Dunstan Boileau Read, Charles Leo Harding, John G. A. Davel, Arthur Harold Gale, Leslie Owen Frank Fysh, Robert Gordon MacGregor, Reginald Arthur Haythornthwaite, and Rosaleen Louise Graves.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—Licences to practise have been conferred upon 46 candidates (9 women and 37 men) who have completed the final examination in medicine, surgery, and midwifery of the Conjoint Board and have complied with the by-laws of the Colleges. This list is supplementary to that published in THE LANCET (Feb. 5th, p. 315). The following are the names and medical schools of the successful candidates:—

Gertrude Alphonso, Calcutta and Royal Free; R. Andrews, London; N. Attygalle, Ceylon and Middlesex; R. Bandyopadhyay, Calcutta and St. Thomas's; H. Berliner and Augusta J. Blumenthal, Univ. Coll.; H. J. Burrows, Cambridge and St. Bart.'s; R. W. Butler, Cambridge and St. Thomas's; Mildred Carpenter, Univ. Coll.; A. Carr, Guy's; B. Chaudhuri, Bombay and Middlesex; Pamela M. G. Churchill, King's Coll.; F. H. N. Cruchley, London; A. S. El-Katib, Cairo and St. Thomas's; V. Freeman, Univ. Coll.; H. J. Gubbin, St. Bart.'s; V. F. Hall, King's Coll.; E. O. Harris, Middlesex; J. W. O. Holmes, St. Bart.'s; S. G. Irlam, London; Freda C. Kelly, Univ. Coll.; A. E. Kingston, Middlesex; J. S. Lewis, St. Mary's; E. M. Lourie, Univ. Coll.; R. W. L. May, Cambridge and St. Thomas's; Helen E. Mayfield, St. Mary's; J. L. Newman, Cambridge and King's Coll.; F. G. Parker, Oxford and Guy's; Muriel V. Paton, Royal Free; G. C. Pether, Middlesex; R. K. Pillay, Madras and London; E. N. Price, St. Mary's; L. J. Rae, Cambridge and London; R. H. Rattray, Charing Cross, E. R. Rees, St. Bart.'s; W. Rosenberg, Witwatersrand and Guy's; R. Rutherford, King's Coll.; M. Schwartz, Cardiff and Univ. Coll.; Helen D. S. C. Scott, Royal Free and Charing Cross; S. Segal, Oxford and Westminster; M. Shaw, Guy's; E. S. Vergette, St. Bart.'s; D. P. Wailling, Bengal and St. Thomas's; L. A. F. Wiles, St. Thomas's; Marian E. Williams, Royal Free; and R. M. Williams, Guy's.

The following candidates were approved in the undermentioned subjects, but are not eligible for diplomas:—

*Medicine.*—Edna E. Adams, Birmingham; Florence M. Allen, King's Coll.; H. W. Allen and C. J. Bashall, St. Thomas's; Constance M. H. Bishop, Charing Cross; W. J. Branday, Birmingham; I. G. Briggs, London; C. F. Brockington, Guy's; W. G. Brookes, Liverpool; W. A. Busby, London; E. N. Butler, King's Coll.; Emily E. Cass, St. Mary's; A. Chaudhuri, St. Bart.'s; Mary C. E. Constantine, Royal Free; A. D. W. Cooke, St. Mary's; W. V. Cruden and R. Cunningham, St. Bart.'s; Constance M. Cusden, Charing Cross; W. N. Dickenson, St. Thomas's; H. Doyle, St. Mary's; G. A. Eason, St. Bart.'s; C. W. Evans, St. Mary's; Isabella Forshall, Royal Free; H. C. Geldard, Middlesex; J. M. Graham, London; M. K. Gyi, Guy's; W. R. E. Harrison, St. Bart.'s; G. L. M. Inkster, Middlesex; Ausa H. Jackson, Royal Free; Caroline M. Kingsmill, St. Mary's; Winifred A Ladds, Royal Free; O. I. Lewis, London; Margaret I. Little, St. Mary's; Janet Lochore, Edinburgh; R. C. Mahajan and E. T. Mankabadi, London; S. P. Meadows, Liverpool; J. K. Moore, Guy's; V. V. Morgan, Middlesex; F. B. Mulvany, London; J. H. Mulvany, King's Coll.; A. B. Nutt, Sheffield; R. Oddie, St. Thomas's; Ethel E. M. Ogilvie, Royal Free; R. L. Osmaston, Univ. Coll.; M. D. Patel, Middlesex; Dulcie J. Peake, Royal Free; Margaret E. Peaker and Gwynedd M. Phillips, King's Coll.; Mervyn W. Platel, St. Bart.'s; E. A. Pye and W. H. Roberts, St. George's; Mona M. Russell-Cruise, St. Mary's; W. H. Scriven and D. W. Stuart, King's Coll.; Dorothy Taylor, St. Mary's; Doris H. Tomes, Westminster; W. E. Underwood, St. Bart.'s; and A. D. Versteegh, St. Thomas's.

*Surgery.*—H. W. Allen, St. Thomas's; Dorothy Arning and H. Arstall, Manchester; H. E. C. Aslett, St. Mary's; G. H. Barendt, St. Bart.'s; J. F. L. Barnes, St. Thomas's; A. Batty, Middlesex; Charlotte Belinky-Raginsky, Charing Cross; V. C. Benson, Guy's; Joan H. Blackledge and Eleanor D. Blunt, Royal Free; J. H. Boultbee, Liverpool; E. W. Bowskill, Manchester; Muriel Brighton, Royal Free; W. G. Brookes, Liverpool; Helen R. B. Buck, Royal Free; E. Burton, London; E. N. Butler, King's Coll; M. S. Chafey, Charing Cross; A. D. Charters, St. Thomas's; E. Clayton-Jones, Guy's; M. Cohen, Middlesex; C. B. Crofts and A. T. Croucher, St. Mary's; S. F. L. Dahne and C. S. Davies, St. Bart.'s; R. S. de Bruyn, Guy's; C. I. D'Netto and C. W. L. Dodd, London; Elsie M. Douglas, Univ. Coll.; Margaret R. Dunlop, Royal Free; Jessie Edwards, Charing Cross; Muriel M. Edwards, Manchester; M. R. Ernst, St. Bart.'s; R. V. Farr, Birmingham; J. C. Fast, Guy's; A. A. H. Fyzee, Univ. Coll.; R. J. S. Garrow, Leeds; R. C. D. Gifford, Birmingham; F. H. Gillett, St. Thomas's; J. L. Glover, Guy's; A. L. Gunn, Cardiff; Bridget S. P. Gurney, Royal Free; D. G. Hamilton; St. Thomas's; H. Hannesson, London; B. Haring, Manchester;

A. H. B. Heeson, Guy's; J. E. Heggart, Middlesex; G. B. M. Heggs, St. Mary's; Kathleen Heyes, Royal Free; H. Hillaby, St. Bart.'s; Janet I. Hoare, Royal Free; W. A. C. Hortor, Middlesex; T. I. Hughes, Bristol; R. E. Isaac, Cardiff; H. M. Jaques, Middlesex; Margaret E. Jones, St. Mary's; S. Kaul and N. A. King, St. Bart.'s; H. J. Krichefski and Nellie I. Lanckenau, Univ. Coll.; O. L. Lander, London; A. H. Lankester, St. Thomas's; L. G. Llewellyn, Middlesex; P. H. Loretz, Guy's; Florence Louis, Royal Free; F. Mansour, Charing Cross; H. E. Martin, Manchester; T. E. Matthews, St. Mary's; Mary M. Moller, Royal Free; T. W. Morgan, St. Thomas's; V. Y. Morgan, Middlesex; Barbara E. M. Morris, St. Mary's; J. H. Mulvany, King's Coll.; Helen E. M. Newman, Royal Free; R. Newton, Manchester; T. St. M. Morris, London; R. E. Norrish, St. Bart.'s; R. O'Meara, Birmingham, W. Panes, Cardiff; T. Pearse, Liverpool; E. A. Pye, St. George's; A. Rabinowitz, Guy's; M. Ragheb, Middlesex; G. W. Rake, Guy's; W. Ralston, London; B. R. R. R. Reddy, Durham; Norah Regan, Manchester; R. I. Richards, St. Bart.'s; Muriel Rippin, Univ. Coll.; W. H. Roberts, St. George's; B. Rosenzvit, Middlesex; S. F. Russell, St. Bart.'s; J. C. Saldanha, Univ. Coll.; R. Saran, Calcutta; V. H. Sarland, Birmingham; H. Shenouda, Manchester; M. R. Sinclair, St. Bart.'s; N. H. Skelton-Browne, Guy's; B. Spencer, St. Thomas's; R. J. Steeds, Univ. Coll.; G. R. Shipley Stewart, Guy's; D. D. Stidston, St. Mary's; H. A. Tracey, St. Bart.'s; H. M. Turnbull, Charing Cross; C. W. Walker, St. Thomas's; E. Ward, Manchester; Maeve Whelen, Royal Free; G. D. D. Wijesekere, Ceylon; L. N. T. Williams, Liverpool; L. D. Williams and M. G. Williams, Cardiff; M. Yankelovitch, Middlesex; and Margaret I. Yeatman, Charing Cross.

*Midwifery.*—M. E. Albury, St. Thomas's; Joan Anderson, Manchester; Dorothy G. Angus, Royal Free; B. A. J. Arthure, Charing Cross; J. H. Attwood, St. Bart.'s; J. F. L. Barnes and H. Bell, St. Thomas's; J. F. Bell, Liverpool; T. G. Benjamin, Guy's; F. W. Besley and L. Blackstone, London; J. H. Boultbee, Liverpool; E. E. Bowen, Middlesex; R. V. Bradlaw, M. T. Brockman, and L. Brown, Guy's; W. H. Brown, St. Mary's; Doris E. Bunbury, Royal Free; Emily E. Cass, St. Mary's; A. D. Charters, St. Thomas's; A. M. Chaudhuri and W. A. Clark, St. Bart.'s; E. Clayton-Jones, Guy's; J. P. Collinson, Sheffield; R. W. Cooper, Middlesex; E. C. Cosgrove, St. Bart.'s; J. H. Cullinan, Guy's; S. F. L. Dahne, St. Bart.'s; Alva A. Daniell, Royal Free; T. S. Daniels, Guy's; E. G. C. Darke, St. Bart.'s; E. L. Davies, Univ. Coll.; L. F. Day, St. Bart.'s; R. S. de Bruyn, Guy's; Helena M. de Hartog, St. Mary's; E. L. F. De Mel, Univ. Coll.; S. J. De Navasquez, Guy's; C. I. D'Netto and G. C. Dorling, London; Elsie M. Douglas, Univ. Coll.; C. B. Drew, St. Thomas's; Antoinette H. P. Ellis, Charing Cross; M. R. Ernst, St. Bart.'s; Grace C. Evans, Royal Free; S. Farfel, St. Bart.'s; J. Fitzsimons, Middlesex; Isabella Forshall, Royal Free; Helen M. G. Foster, Univ. Coll.; H. D. F. Fraser, St. Bart.'s; J. Furman, Durham; Yetta Gimpelson, St. Mary's; Barbara M. L. Glover, Royal Free; V. Goldman, Birmingham; L. C. Griffin, St. Thomas's; Alma B. Hardy, Royal Free; G. B. M. Heggs, St. Mary's; J. S. Hensman, St. Bart.'s; Mary M. R. Higson, Charing Cross; Janet I. Hoare, Royal Free; A. N. Hobbs, St. Bart.'s; Lilian J. Hubble, King's Coll.; H. T. J. Hynes, St. Bart.'s; G. L. M. Inkster, Middlesex; R. E. Isaac, Cardiff; L. R. Janes, St. Bart.'s; P. D. Johnson, St. Thomas's; Olive M. G. Jones, Royal Free; R. L. Jones, Birmingham; W. R. Keizer, London; A. R. Kerridge, Royal Free; N. A. King, St. Bart.'s; Winifred A. Ladds, Royal Free; O. L. Lander, London; L. E. Lane, Guy's; A. H. Lankester, St. Thomas's; F. G. Leslie, London; S. C. Lewsen, Guy's; M. J. Liberson, Durham; K. Lindenbaum, St. Mary's; P. V. MacGarry, Dublin and London; Muriel M. Manley, St. Mary's; S. K. Mansor, Birmingham; Ma Y. May, Royal Free; F. J. Milward, St. Thomas's; W. E. S. Moreton, Charing Cross; T. W. Morgan, St. Thomas's; K. G. Nerurkar, Guy's; Helen E. M. Newman, Royal Free; C. G. M. Nicol, Charing Cross; S. W. K. Norris, Birmingham; T. St. M. Norris, London; R. E. Norrish, St. Bart.'s; M. D. Nosworthy, R. Oddie, and V. E. Palmer, St. Thomas's; Dulcie J. Peake, Royal Free; R. L. Peregrine, Guy's; T. A. P. Proctor, Birmingham; G. W. Rake, Guy's; B. R. R. Reddy, Durham; Muriel Rippen, Univ. Coll.; W. V. Roache, St. Bart.'s; D. T. Robinson, Manchester; Phyllis M. Robottom, Westminster; L. W. Rose, Guy's; S. F. Russell, St. Bart.'s; S. Shalaby, London; V. C. Shroff, Westminster; M. R. Sinclair, St. Bart.'s; A. Sirry, Birmingham; Eileen R. B. Snow, Royal Free and St. Mary's; J. E. Snow, St. Bart.'s; G. A. Stevenson, Birmingham; T. C. Stevenson, St. Thomas's; W. H. Tandy, Birmingham; K. R. Unger, Middlesex; K. S. Venkatachala Ayyar, Guy's; Joan B. Walker; Royal Free; D. Wardrop, Birmingham; L. Wasef, Manchester; J. R. S. Webb, St. Thomas's; Margaret A. Willcox, King's Coll.; J. D. Williams and L. D. Williams, Cardiff; S. T. Williamson, Guy's; W. M. Wilson and W. A. Wood, St. Bart.'s; and R. G. Zaglama, Manchester.

UNIVERSITY OF LONDON.—The title of Professor of Psychology has been conferred on Miss Beatrice Edgell, Ph.D., D.Litt., in respect of the post held by her at Bedford College.

AN INTERNATIONAL CONGRESS AT FRANZENSBAD.—Medical men attending the Second International Congress in Female and Cardiac Diseases which will be held at Frantiskovy lázné (Franzensbad) in May, will be granted a free Czechoslovak visa. Further particulars may be had on application to the Czechoslovak Legation, 8, Grosvenor-place, London, S.W. 1.

ROYAL SOCIETY OF ARTS.—On Wednesday, Feb. 23rd, at 8 P.M., Mr. Francis H. Carr, President of the Society of Chemical Industry, will lecture on Insulin and its Manufacture.

CONVALESCENT HOME FOR GLOUCESTER.—A lady living near Gloucester has given her house and an endowment of £1000 a year for a convalescent home for women and children of Gloucester. The home will be opened in May for 20 inmates.

CHELSEA CLINICAL SOCIETY.—A meeting of this society will be held at the Rembrandt Hotel, Thurloe-place, London, S.W., on Tuesday, Feb. 15th, at 8.30 P.M., preceded by dinner at 7.30 P.M. There will be a discussion on the Acute Abdomen, the speakers including Sir John Broadbent, Mr. Duncan Fitzwilliams, and Mr. Zachary Cope.

INTERNATIONAL POST-GRADUATE MEDICAL COURSE.—A number of courses are to be held at Berlin under the auspices of the University and other bodies. The subjects include Progress of Medicine (March 1st to 12th); Diseases of the Heart, Kidneys, and Vessels (March 14th to 23rd); Scientific Knowledge of Rays (March 24th to 31st); and Diagnostic and Therapeutic Technique (April 1st to 14th). There will also be other special courses and opportunities for work in Berlin hospitals. Further particulars may be had from Kaiserin Friedrich-Haus Berlin N.W. 6, Luisenplatz 2–4.

SPAHLINGER TREATMENT OF TUBERCULOSIS.—The following resolutions have been passed at a meeting of the Lancashire and Cheshire Branch Council of the British Medical Association:—

(1) That the branch council reaffirms the decision of March 24th, 1926, that a case has been made out for a full investigation of the Spahlinger treatment in England under complete medical supervision.

(2) That under no circumstances does this branch of the B.M.A. lend its name or reputation to the support of a public appeal for funds in relation to the Spahlinger treatment until such investigation has taken place in England with a successful issue.

POST-GRADUATE TOUR IN THE UNITED STATES OF AMERICA AND CANADA.—A tour is being organised by the Section of Surgery of the Royal Society of Medicine to start on July 23rd, 1927. It is proposed that the complete tour shall take about six weeks. Among the places visited will be Boston, New Haven, New York, Philadelphia, Baltimore, Washington, Cleveland, Detroit, Ann Arbor, Grand Rapids, Chicago, Rochester (Mayo Clinic), Great Lakes, Niagara, Toronto, Ottawa, and Montreal. Facilities will be offered to members who wish to shorten the tour, which is primarily organised for surgeons, but arrangements will also be made for those interested in other branches of medicine. The cost of the whole tour inclusive of ocean passage, rail and other transport, hotels and meals, will be approximately £140. Travelling facilities on the same terms will be offered to the wives of those taking part in the tour. Further particulars may be obtained from Mr. C. Max Page, 134, Harley-street, London, W. 1.

MIDDLESEX HOSPITAL: NEW INSTITUTE OF OTO-LARYNGOLOGY.—On Feb. 8th the new Institute of Oto-laryngology, presented to the Middlesex Hospital by Mr. T. R. Ferens, was formally handed over by him to Prince Arthur of Connaught, chairman of the hospital. At present housed in the annexe, the institute will be transferred to new quarters as soon as the rebuilding of the hospital is complete. It consists of a general library, three research laboratories, a common-room, a library and museum, a photographic dark room and a lecture-room. Mr. Ferens's gift was the sum of £20,000, and as the institute is to be used exclusively for research and teaching, it is hoped that studentships may be provided for post-graduates. Eight or ten of these workers can be accommodated and no charge will be made for the use of apparatus and equipment. Such students, however, will have to find their own maintenance and, in order that candidates of exceptional merit may be enabled to take up research work at the institute whether they can support themselves or not it is proposed that three post-graduate studentships of £300 each should be established, for students from the United States, the Dominions, and Great Britain respectively. The admirable equipment, and the fact that the institute is to be devoted to research will, it is hoped, make it a centre of post-graduate instruction in oto-laryngology to which students will come from all parts of the world, and it is intended that the studentships shall be reserved for graduates of special ability. After Prince Arthur of Connaught had formally received the institute from Mr. Ferens, the value of the gift was acknowledged by Mr. Somerville Hastings, aural surgeon to the Middlesex Hospital, and Mr. F. J. Cleminson, assistant aural surgeon. At the conclusion of the proceedings Prince Arthur announced that Mr. Bernhard Baron had offered to endow the British studentship at the institute.

CONTINENTAL MEDICAL TOURS.—The *Bruxelles Médical* has arranged a number of tours to Morocco and to the Eastern Mediterranean, in which doctors and their families are invited to take part at reduced rates. The dates of starting are from March 12th onwards, and full particulars may be had from the Section des Voyages de *Bruxelles Médical*, 29 Boulevard Adolphe Max, Brussels.

CAMBRIDGE GRADUATES' MEDICAL CLUB.—The annual dinner of the Club will be held at the Langham Hotel on Tuesday, March 1st, at 7.15 for 7.30 P.M. Sir Humphry Rolleston, President of the Club, will take the chair. All members of the Club are invited to be present, and all Cambridge medical men who are graduates of the University are eligible for membership. Application forms can be obtained from the honorary secretaries, Mr. R. M. Vick, of 113, Harley-street, London, W. 1, and Dr. F. G. Chandler, of 1, Park-square-west, Portland-place, N.W. 1.

TERRITORIAL ARMY MEDICAL OFFICERS' ASSOCIATION.—The annual dinner of the Association will be held on Thursday, Feb. 24th, at 7.30 for 8 P.M., in the Café Royal, 68, Regent-street, London, W. 1. The Association has been formed for consideration of all matters of interest or benefit to the Territorial medical officer. The dinner tickets are 12*s.* 6*d.* (without wine) and can be obtained from the hon. secretary, Lieut.-Colonel L. A. Harwood, at 37, Russell-square, London, W.C. 1.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—A quarterly meeting of the College was held on Feb. 1st, Prof. G. M. Robertson, the President, in the chair. Dr. James Richan Drever and Dr. Alan Leonard Smith Tuke were introduced and took their seats as Fellows of the College. Dr. William Bell was elected a Fellow of the College, and the following were elected Members: Robert Finlay Aitken, Sittampalam Thiagarajah, Alexander Murray Affleck, James Kirkwood Slater, and Prag Nath Kapur.

HOSPITAL SATURDAY AND SUNDAY FUNDS.—The delegates of the London Hospital Saturday Fund have just distributed £69,000, a reduction of about £2400 on last year. The falling off is accounted for by the industrial depression. The general hospitals, 47 in number, received £22,790, and 79 special hospitals £21,808. Altogether 235 institutions benefited.—The same influences account for a falling off of nearly £1000 in the produce of Birmingham Hospital Sunday Fund, which is more than accounted for by smaller church collections; the total was £8782. The administrative expenses have fallen from 9·6 in 1923 to 6·2 in 1926.

AN OVERCROWDED UNION INFIRMARY.—Dr. J. D. Giles, the medical superintendent, has reported to the Salford Board of Guardians upon the overcrowding of Hope Union Infirmary. In addition to the congestion of the wards, a large proportion of the day-rooms have had to be used for sleeping accommodation for sick patients, while others have been sleeping on floors and tables in almost every ward. There are 1014 patients in a hospital which was built to accommodate 850. A committee has been appointed to deal with the matter.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On Thursday, Feb. 17th, at 5 P.M., at the rooms of the Medical Society of London, 11, Chandos-street, W. 1, Dr. Wilfred Harris will lecture on Trigeminal Neuralgia. On Feb. 14th, at 2 P.M., Mr. Harold Kisch will hold a demonstration in clinical surgery at the Central London Throat, Nose and Ear Hospital; those intending to be present are asked to notify the hospital secretary (Museum 1539). On Feb. 18th, at 5 P.M., Mr. G. Viner will give a clinical demonstration on Ocular Palsies at the Royal Westminster Hospital. The lecture and both demonstrations will be open to members of the medical profession without fee. The following courses are in progress this month: at the Lock Hospital, in Venereal Diseases; at the Paddington Green and Victoria Hospitals, in Children's Diseases; at St. John's Hospital, in Dermatology; and at the National Hospital, Queen-square, in Neurology. Details of any of these courses can be obtained from the Fellowship. The subjects of the Special Courses in March will include: Diseases of the Chest, Brompton Hospital, all day for one week, fee £3 3*s.*; Diseases of Children, Queen's Hospital, all day for two weeks, fee £3 3*s.*; Ophthalmology, Royal Eye Hospital, afternoons for two weeks, fee £1 1*s.*; Gynæcology, Chelsea Hospital, mornings and/or afternoons for two weeks, fee £5 5*s.*; and Orthopædics, Royal National Orthopædic Hospital, all day for two weeks, fee £2 2*s.* There will also be a practitioner's course at the London Temperance Hospital in the late afternoons for two weeks (fee £1 1*s.*). Practical courses in Anæsthetics can be arranged, and also courses in Obstetrics; arrangements are made for clinical assistants. Syllabuses of the Special and General Courses and copies of the *Post-Graduate Medical Journal* may be had from the Secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

MANCHESTER CITY COUNCIL AND VACCINATION.—The city council at its meeting on Feb. 2nd, by 73 votes to 31, supported a resolution of its public health committee, urging upon the Ministry of Health the importance of amending the Vaccination Acts so as to make vaccination "more general and efficient." The resolution supported the resolution passed by a conference of medical officers of health in Durham urging the Ministry to amend these Acts and to make vaccination more general and efficient, as vaccination afforded "the quickest, most scientific, and most economic means of preventing and arresting outbreaks of small-pox."

BIRMINGHAM MATERNITY HOSPITAL.—Little more than a year ago there was opened debt-free a new block of this hospital which increased the number of beds from 32 to 65 and provided much collateral accommodation. The old building was then overhauled and a new operating theatre and a pathological laboratory were built. The result of these necessary enterprises is a heavy deficit. The hospital is an institution of primary importance to Birmingham. It treats in-patients (1237 last year) and out-patients (2446 last year), provides qualified resident midwives in seven districts of the city who attend patients in their own homes, and is a training school for midwives and the medical students of the University.

JOINT TUBERCULOSIS COUNCIL.—At a meeting of the Council held at 1, Upper Montague-street, London, W.C., on Jan. 15th, Sir Henry Gauvain was elected chairman for 1927, Dr. Lissant Cox, vice-chairman, Dr. E. Ward, Secretary, and Dr. James Watt, Treasurer. A committee was appointed "to consider how the tuberculosis service may be rendered more efficient; whether, with this object, evidence shall be given before the Royal Commission on Local Government; and, if so, what points should be brought forward." Fourteen years' experience of the working of tuberculosis schemes has brought some knowledge of their possibilities as well as their limitations, and the committee represents all the interests concerned. Recent statistical returns for which the Ministry of Health has asked are likely to lead to modifications in administration, and the time seemed appropriate for tuberculosis workers to overhaul their methods. On behalf of the Research Committee Dr. S. R. Gloyne presented a report on Disinfection. Dr. Lissant Cox reported that replies were coming in to the 3800 circulars issued on "The Fate of Children in Tuberculous Households." Dr. W. Brand outlined the post-graduate courses proposed for the present year: one at Copenhagen, one in London on non-pulmonary tuberculosis, at which light treatment would be dealt with, besides artificial pneumothorax, the interpretation of X ray plates, and other modern aids to diagnosis and treatment. The Council meets next on Saturday, May 21st, at 10 A.M.

# Medical Diary.

## SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Feb. 14th.—5 P.M., WAR: Squadron-Leader P. M. Keane: Service Architecture and the Requirements of Accommodation in Tropical and Subtropical Countries.

TUESDAY.—5.30 P.M. General Meeting of Fellows. Ballot for Election to the Fellowship.

8.30 P.M.: PATHOLOGY.

H. J. Parish: Unusual Forms of the Diphtheria Bacillus. J. Henderson Smith: Recent Work on the Virus Diseases of Plants. Demonstration: S. C. Dyke: Papilloma of the Œsophagus.

WEDNESDAY.—5 P.M., HISTORY OF MEDICINE. Prof. J. F. Dobson: Erasistratus. Mr. W. R. Dawson: Contribution to the History of Mummification (postponed from Jan. 19th). Dr. Charles Singer: An Example of the Egyptian God Bes exhibiting Symptoms of Spina Bifida.

THURSDAY.—5 P.M., DERMATOLOGY: (Cases at 4 P.M.)

FRIDAY.—8 P.M., OBSTETRICS AND GYNÆCOLOGY.

*Specimens:*

Dr. S. Gordon Luker: 1. Fibromyoma of Uterus, Rupture of Capsule, with Protrusion of part of the Tumour, with Secondary Necrosis. 2. Fibromyoma showing a small area of Commencing Sarcoma. 3. A case of Ovarian Pregnancy. Miss Alice Bloomfield: 1. A case of Patent Wolffian or Gartner's Duct. 2. A case of Cyst occupying Utero-vesical Space associated with possible Repeated Rupture.

*Paper:*

Dr. Arthur Crook: Necrosis of the Cortex of the Kidney after Labour.

8.30 P.M.: ELECTRO-THERAPEUTICS.

*Paper:*

Prof. Franz M. Groedel (Bad Nauheim): Cardiovascular Syphilis—an X Ray Study.

MEDICINE: Members of this Section are specially invited to attend this Meeting.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.
THURSDAY, Feb. 17th.—8.15 P.M., Lieut.-Colonel W. P. MacArthur: Old-Time Typhus in Britain, preceded by a demonstration on the subject at 7.45 P.M.

ROYAL SANITARY INSTITUTE, 90, Buckingham Palace-road, S.W.
SESSIONAL MEETING.
TUESDAY, Feb. 15th.—5.30 P.M., Dr. William Robertson will open a discussion on Immunisation against Diphtheria.

## LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Feb. 14th, to SATURDAY, Feb. 19th.—FELLOWSHIP OF MEDICINE. Special lecture at the Medical Society, 11, Chandos-street, W., at 5 P.M., on Thurs. Dr. Wilfred Harris: Trigeminal Neuralgia. Open to all members of the medical profession without fee.—CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C. Special clinical surgery demonstration on Feb. 14th, at 2 P.M., by Mr. Harold Kisch. Open to all members of the medical profession, without fee, but those wishing to attend are asked to notify the Hospital Secretary. Museum 1539.—ROYAL WESTMINSTER OPHTHALMIC HOSPITAL, Charing Cross, W.C. Special clinical ophthalmic demonstration at 5 P.M. on Feb. 18th, by Mr. G. Viner, on Ocular Palsies.—LONDON LOCK HOSPITAL, Dean-street, W. Special Course in Venereal Diseases. Clinical work daily and special lectures.—COMBINED COURSE IN CHILDREN'S DISEASES, Paddington Green Hospital and Victoria Hospital for Children. All day course, consisting of lectures and demonstrations. Further information from the Secretary of the Fellowship of Medicine.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Feb. 14th.—10 A.M., Surgical Clinic. 2 P.M., Medical Cases in the Wards. 2.30 P.M. to 5 P.M., Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 P.M. to 5 P.M., Medical, Surgical, Throat, Nose, and Ear Clinics. Operations.
WEDNESDAY.—2.30 P.M. to 5 P.M., Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M., Dental Clinic. 2.30 P.M. to 5 P.M., Medical, Surgical, and Ear, Nose, and Throat Clinics. Operations.
FRIDAY.—10.30 A.M., Throat, Nose, and Ear Clinics. 2.30 P.M. to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.
On TUESDAY, Feb. 15th, and THURSDAY, Feb. 17th, there will be special demonstrations of Ear, Nose and Throat Cases and Surgical Cases by Mr. W. Ibbotson and Mr. H. W. Carson respectively.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Feb. 14th.—10 A.M., Mr. MacDonald: Genito-Urinary Operations. 2 P.M., Mr. Addison: Surgical Wards. 2 P.M., Dr. Ironside: Medical Out-patients.
TUESDAY.—10 A.M., Medical Registrar: Clinical Methods. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Vlasto: Throat, Nose, and Ear Department.
WEDNESDAY.—10 A.M., Dr. Owen: Medical Diseases of Children. 2 P.M., Dr. Scott Pinchin: Medical Out-patients. 2.30 P.M., Mr. Armour: Surgical Wards.
THURSDAY.—10 A.M., Dr. Stewart: Neurological Department. 12 noon, Mr. Simmonds: Demonstration of Fractures. 3 P.M., Sir Henry Simson: Gynæcological Wards.
FRIDAY.—11 A.M., Dr. Pritchard: Modern Methods in Medicine. 2 P.M., Mr. Sinclair: Surgical Out-patients.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Mr. Banks-Davis: Operations of the Throat, Nose, and Ear.
Daily.—10 A.M. to 5 P.M., Operations, Medical, Surgical, Special, Out-patient Departments (Saturdays 10 A.M. to 1 P.M.).

ROYAL NORTHERN HOSPITAL POST-GRADUATE COURSE.
TUESDAY, Feb. 15th.—3.15 P.M., Dr. C. C. Beatty: Causes and Treatment of Vomiting in Children.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Feb. 17th.—4 P.M., Dr. Poynton: Points in the Treatment of Alimentary Diseases.

NATIONAL HOSPITAL FOR DISEASES OF THE NERVOUS SYSTEM, Queen-square, W.C.
MONDAY, Feb. 14th.—2 P.M., Dr. Hinds Howell: Out-patient Clinic. 3.30 P.M., Mr. Leslie Paton: Lesions of the Trigeminal Nerve affecting the Eye.
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Greenfield: The Cerebro-spinal Fluid in Meningitis.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Gordon Holmes: Cerebellar Disease.
FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Mr. Perkins: Injuries to Peripheral Nerves.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Feb. 15th.—5 P.M., Dr. G. B. Dowling: Staphylococcal Infections.
THURSDAY.—5 P.M., Dr. K. N. Bailey: Pathology Demonstration.

ROYAL DENTAL HOSPITAL OF LONDON SCHOOL OF DENTAL SURGERY POST-GRADUATE LECTURES.
WEDNESDAY, Feb. 16th.—5.30 P.M., Mr. F. Coleman: Relation of Dentistry to Allied Sciences.

PEOPLE'S LEAGUE OF HEALTH. (Sims Woodhead Health Lectures.)
MONDAY, Feb. 14th.—6 P.M. (at the Medical Society of London, 11, Chandos-street, W.). Mr. E. B. Turner: Recreation and Physical Exercise.

ST. MARGARET'S HOSPITAL FOR WOMEN, Acomb-street, Whitworth Park, Manchester.
WEDNESDAY, Feb. 16th.—4.15 P.M., Mr. A. C. Magian: Treatment of Painful Menstruation.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
FRIDAY, Feb. 18th.—3.30 P.M. (at the Royal Hospital), Mr. Blacow Yates: Hernia and their Complications.

# Appointments.

ABERNETHY, D. A., B.M., B.Ch. Oxf., has been appointed Hon. Assistant Surgeon to the Radcliffe Infirmary and County Hospital, Oxford.

BAKER, LILY, M.B., B.Ch. R.U.I., F.R.C.S.I., to the charge of the Antenatal Department, Bristol Royal Infirmary.

DOUGLAS, T. H. J., L.D.S., F.R.F.P.S. Glasg., Dental Officer (Dental Referee) in the Department of the Scottish Board of Health.

RIGGALL, ROBERT M., L.R.C.P. Lond., M.R.C.S., L.R.C.S. Edin., a Member of the Honorary Clinical Psychological Staff of the West End Hospital for Nervous Diseases.

WHITFIELD, A., M.D., F.R.C.P. Lond., Emeritus Professor of Dermatology, King's College, London.

Certifying Surgeons under the Factory and Workshop Acts: MACKAY, A. M., M.B., Ch.B. Edin. (Lynn); ROBERTSON, J. M. (Stock District, Essex).

St. Thomas's Hospital: HARPER, C. H., M.R.C.S., L.R.C.P. Lond., THOROLD, G. P., M.B., B.Ch. Oxf., ELLIS, R. W. B., M.B., B.Ch. Camb., CONNELL, A. B., M.R.C.S., L.R.C.P. Lond., WIGLEY, J. G., M.B., B.Ch. Camb., METCALFE, R. H., M.B., B.Ch. Camb., YULE, E., M.R.C.S., L.R.C.P. Lond., RICHARDSON, L. A., M.B., B.Ch. Camb., Casualty Officers and Resident Anæsthetists; MILFORD R. D., M.B., B.Ch. Camb., AMIES, C. R., M.B., B.S. Lond., LING, T. M., M.B., B.Ch. Oxf., WILLIAMS, D. O., M.B., B.Ch. Oxf., Resident House Physicians; CHIESMAN, W. E., M.B., B.Ch. Camb., Resident House Physician (for Children); BLAXILL, B., M.R.C.S., L.R.C.P. Lond., FOTHERGILL, E. L., M.B., B.Ch. Oxf., CROFT, C. R., M.B., B.Ch. Oxf., BYRNE-QUINN, A., M.B., B.S. Lond., Resident House Surgeons; TIPPETT, G. O., M.B., B.S. Lond., Resident Orthopædic House Surgeon; SCREECH, J. A., M.B., B.S. Lond., and WILSON, A. G., M.R.C.S. L.R.C.P. Lond., Resident House Surgeons for Ear and Throat respectively; MASCALI, W. N., M.R.C.S., L.R.C.P. Lond., Senior Obstetrica House Physician; WRIGLEY, A. J., M.B. B.S. Lond., F.R.C.S. Eng., Junior Obstetrica House Physician; STANLEY, C. A., M.R.C.S., L.R.C.P. Lond., Senior Ophthalmic House Surgeon; BOWER, M. DYKES, M.B., B.Ch. Oxf., Junior Ophthalmic House Surgeon.

# Vacancies.

*For further information refer to the advertisement columns.*

*Bangor, Carnarvonshire and Anglesey Infirmary.*—H.S. £200.
*Birmingham University.*—Professor of Physiology. £1000.
*Barnsley, Beckett Hospital.*—Sen. H.S. £220.
*Bethnal Green Metropolitan Borough.*—M.O.H. £1000.
*Brighton, Royal Sussex County Hospital.*—Hon. Clin. Asst. to Ear, Nose and Throat Dept.
*Bristol Mental Hospital.*—Second Asst. M.O. £400.
*Bury and District Joint Hospital Board.*—Asst. Med. Supt. £400.
*Carlisle, Cumberland Infirmary.*—H.P. At rate of £155. Also Jun. H.S. At rate of £135.
*City of London Maternity Hospital, City-road, E.C.*—Asst. Res. M.O. At rate of £80.
*Dublin, Royal City Hospital, Upper Baggot-street.*—Matron. £175.
*Durham County Council.*—Asst. Welfare M.O. £600.
*East London Hospital for Children and Dispensary for Women, Shadwell, E.*—Asst. Surg.
*Elizabeth Garrett Anderson Hospital, Euston-road, N.W.*—Asst. Path. At rate of £150. Also Asst. Phys., Mechano-therapeutic Dept. £100.
*Evelina Hospital for Children, Southwark.*—H.P. At rate of £120.
*French Hospital and Dispensary, 172, Shaftesbury-avenue, W.C.*—Hon. Clin. Asst.
*Hackney Hospital, 230, High-street, Homerton, E.*—Jun. Asst. M.O. £350.
*Hospital for Sick Children, Great Ormond-st., W.C.*—Cas. O. £100.
*Hull Royal Infirmary.*—Cas. H.S. At rate of £130.
*King's College Hospital, S.E.*—Radiographer.
*Lancashire County Council.*—Asst. County M.O.'s. £800.
*Lancashire County Mental Hospital, Winwick, Warrington.*—Asst. M.O. £250.
*Leamington Spa, Warneford General Hospital.*—Res. H.P. £150.

*Leeds City Tuberculosis Sanatorium, Killingbeck.*—Asst. Res. M.O. £250.
*Liverpool Open-air Hospital for Children, Leasowe.*—Jun. M.O. £200.
*L.C.C. Mayford Industrial School for Boys, near Woking.*—Dentist. £47 5s.
*London Hospital, E.*—First Asst. and Reg. £300.
*Manchester, Ancoats Hospital.*—Asst. Surg. Reg.
*Manchester Royal Eye Hospital.*—Jun. H.S. £120.
*Manchester, St. Mary's Hospital, Whitworth Park.*—Res. Surg. O. £200.
*National Hospital, Queen-square, W.C.*—Res. M.O. £200.
*Newcastle-upon-Tyne, Wooley Sanatorium, near Hexham.*—Asst. M.O. £350.
*Nottingham General Hospital.*—Res. Cas. O. At rate of £200.
*Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.*—District Res. M.O. Also Asst. Res. M.O. Each at rate of £80.
*Queen's Hospital for Children, Hackney-road, E.*—Res. M.O. £200. Also H.P. and H.S. Each at rate of £100.
*Royal Free Hospital, Gray's Inn-road, W.C.*—Second Asst. in Ven. Dis. Dept. £1 1s. per session. Also Asst. Phys.
*Royal London Ophthalmic Hospital, City-road, E.C.*—Sen. H.S. £150.
*Royal Northern Hospital, Holloway, N.*—Res. M.O. £200.
*Ryde, Isle of Wight, Children's Hospital and Maternity Home.*—Res. M.O. At rate of £100.
*Smethwick County Borough.*—Asst. M.O.H. and School M.O. £600.
*South Shields County Borough.*—Venereal Dis. M.O. £750.
*Stoke-on-Trent City.*—M.O.H. £1400.
*Swansea County Borough.*—Asst. M.O. £600.
*Talgarth, Breconshire, South Wales Sanatorium.*—Jun. Res. M.O. £200.
*Tottenham Maternity and Child Welfare Committee.*—Asst. M.O.
*Victoria Hospital for Children, Tite-street, Chelsea, S.W.*—Hon. Anæsthetist.
*Watford Peace Memorial Hospital.*—Res.M.O. At rate of £150.
*West Bromwich, District Hospital.*—Res. H.S. At rate of £200.
*West London Hospital, Hammersmith-road, W.*—H.P. and two H.S.'s. Each at rate of £100.

The Chief Inspector of Factories, Home Office, London, S.W., announces a vacant appointment for a Certifying Factory Surgeon at Clwt y Bont, Caernarvonshire.

# Births, Marriages, and Deaths.

## BIRTHS.

BROOKS.—On Jan. 29th, at Louise Margaret Hospital, Aldershot, the wife of Captain J. E. Brooks, R.A.M.C., of a son.
DANSIE.—On Feb. 6th, to Dr. and Mrs. Dansie, of Welwyn—a son.
HAMBER.—On Feb. 3rd, at Lowlands, Fordingbridge, Hants, the wife of John F. Hamber, M.R.C.S., M.R.C.P., of a son.
STEPHENS.—On Feb. 2nd, at Withington Hall, Withington, the wife of Dr. James R. W. Stephens, of a daughter.
WATNEY.—On Feb. 3rd, at Heron Croft, Woldingham, the wife of Dr. Martyn Watney, of a son.
WINDER.—On Feb. 6th, at a nursing home, Southampton, the wife of Lieut.-Colonel M. G. Winder, R.A.M.C., of a daughter.

## MARRIAGES.

BRADNACK—KIRK.—On Feb. 3rd, 1927, at St. Andrew's, Newcastle-on-Tyne, Gerald A. A. Bradnack, M.R.C.S., L.R.C.P., of Barton-on-Humber, Lincs, to Nora Winifred Kirk, M.B., B.S. Durh., of 34, Eldon-place, Newcastle-on-Tyne.
NORCOTT—COOK.—On Feb. 3rd, at Wesleyan Church, Wallington, William Boyle Norcott, M.R.C.S. Eng., L.R.C.P. Lond., to Margaret, youngest daughter of the late Mr. and Mrs. W. T. Cook, Cranley House, Wallington.
PATEY—SUMMERS.—On Feb. 5th, at Holy Trinity Church, Hounslow, David Howard Patey, F.R.C.S., to Gladys Joyce, daughter of Mr. G. Hamilton Summers, L.D.S., and Mrs. Summers, of Hounslow, Middlesex.

## DEATHS.

ARNOLD.—On Feb. 5th, at Byfield House, Painswick, Gloucestershire, after a few days' illness, Francis Sorell Arnold, B.A., M.B. Oxf., in his 67th year.
CAIE.—On Feb. 6th, at Cobden-road, Edinburgh, William James Caie, M.A., M.B., Ch.B., of Highbury House, Bury St. Edmunds.
ELLIOT.—On Jan 30th, at Greenhill-gardens, Edinburgh, after a very short illness, Andrew James Elliot, M.D., F.R.C.S.E., of Ardfenaig, Isle of Mull, and formerly of Noakachari, Assam.
HEDLEY.—On Feb. 4th, in London, suddenly, of heart failure, John Hedley, J.P., M.D., of Cleveland Lodge, Middlesbrough, aged 84.
HOGGAN.—On Feb. 5th, at a nursing home in Brighton, Frances Elizabeth Hoggan, M.D., in her 83rd year.
SMITH.—On Feb. 5th, at Redcroft, Port Talbot, D. Lloyd Smith, M.B. Lond., of Llandrindod Wells, aged 55.
STEDMAN.—On Feb. 2nd, at Bramcote, Weybridge, Frederic Osmund Stedman, M.D., aged 64 years.
TRIGGS.—On Feb. 1st, at a nursing home at Malden, Surrey, Fleet-Surgeon J. B. Bowden Triggs, M.B., R.N., formerly of Southsea, in his 76th year.

*N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.*

# Notes, Comments, and Abstracts.

## ABRAHAM CHOVET.

Dr. William Snow Miller, of Madison, Wisconsin, contributes to Annals of Medical History, vol. viii., No. 4, an interesting paper upon a little known but outstanding figure in American medicine—namely, Dr. Abraham Chovet, who was one of those eccentric personalities in which the eighteenth century was so rich. Little is known of his early life, but his father, David Chovet, was a wine merchant in London, and Abraham was born in 1704 and was probably French by extraction. In 1720 he was apprenticed for seven years to a surgeon, by name Peter Gougoux Lamarque, a foreign brother of the Barber Surgeons Company, at a fee of 100 guineas. When out of his articles he went abroad and studied anatomy under Jacques Bénigne Winslow in Paris. In 1732 we find him returned to London, giving lectures and demonstrations in anatomy, and publishing a small brochure of 26 pages, about 6 by 8 inches, with the inclusive title, "A Syllabus or Index of all the Parts that enter the Composition of the Human Body; in Twelve Lectures for the use of those that go through Courses of Anatomy." Chovet had been in the habit of using wax figures of anatomical preparations which, made by Denoué, professor of anatomy to the Academy of Sciences at Paris, had been brought to London. These apparently did not satisfy Chovet, for he mentions in the preface to his syllabus that he had "contrived a body in wax (now in hand) wherein the action of the heart and lungs, and the circulation of the blood, will be made visible which I hope in some time to complete." By 1733 this aim was attained, for an advertisement in the *London Post* on Dec. 27th of that year states that there is to be seen "this day and for the future, at Mr. Lamark's, Surgeon in Orange-street, Leicester Fields, Mr. Chovet's, the Surgeon's, New Figure of Anatomy, which represents a woman chained down upon a table, supposed opened alive; wherein the circulation of the blood is made visible though glass veins and arteries the circulation is also seen from the mother to the child .... with the Histolick (*sic*) and Diastolic motion of the heart. . . ." In 1734 Chovet was appointed a demonstrator to the Barber Surgeons, but continued to give "Compleat Private Courses of Human Anatomy," particulars of which could be obtained at various places and amongst others at the Rev. Dr. Desaguliers's house in Channel-row, Westminster. This Desaguliers was most likely John Theophilus, a natural philosopher of Huguenot extraction, born at Rochelle, lecturer on experimental philosophy at Hart Hall, Oxford, in 1710, rector of Whitechurch, Middlesex, in 1714. He died in 1744. In 1736 Chovet resigned his position as demonstrator and left London; according to a story related by Weir Mitchell, whose father had it from Dr. Physick, 1768-1837, Chovet had tried to save a malefactor about to be hanged by doing a preliminary tracheotomy, and the Government of the day did not regard this experiment with favour. History does not record whether the attempt was successful, but Chovet left the country. After a somewhat erratic sojourn in the West Indies he settled about 1774 in Philadelphia, taking a house in Vidal's-alley, where he at once commenced a course of lectures on anatomy, delivered "on elegant Anatomical Wax Figures." The opening lecture, delivered on Nov. 25th, was, according to the contemporary press notice in the *Pennsylvania Gazette*, "conducted with the greatest politeness and decorum, and the company departed, expressing themselves in the highest terms of approbation." The elegant anatomical wax figures passed after Chovet's death into the keeping of the Pennsylvania Hospital and afterward into that of the University. Their ultimate fate is not exactly known, but in all probability they perished in the fire which destroyed much of the University museum in 1888. Alongside of his work in anatomy, Chovet would seem to have enjoyed a thriving clinical practice in spite of, or possibly on account of, his many eccentric habits. He died in March, 1790, in his eighty-sixth year.

## INFLUENZA IN 1782.

INFLUENZA is much discussed on all hands just now, and it would be singular if it were not. The public interest is proved by the many articles—most of them written upon real information—which are appearing daily in the press. Our descendants should find the writing of medical history much facilitated. The influenza epidemic of 1782 is alluded to in all histories of the disease, but how uncertain is our information. It seems to have been attended with more than ordinarily violent symptoms, and has been recorded by a number of witnesses who had not, however, the assistance of a popular press. Of these one of the most explicit was Dr. R. Hamilton, of Luton, whose "Description of the Influenza" was published in 1782. In May of that year the public had been debilitated by months of cold wet weather. On the 22nd the thermometer stood one degree

lower than on the preceding Dec. 22nd, and Whitsunday was as cold as Christmas Day. Hamilton describes a terrific May thunderstorm, and this reminds us that the old writers generally regarded influenza epidemics as dependent on sensational changes of weather or connected with volcanic eruptions. The influences of the stars and the heavens had, indeed, been long held to preside over disease, especially over sudden epidemics. The Italian name influenza signified astral influence and was first generally used during the great epidemic in 1743.

Standing in the street of Luton, Hamilton watched the lightning, which appeared not in flashes, "but in large balls, one rolling after another over the heavens northward, and now and then dashing one against another." This was an omen, for nearly at the same time the influenza appeared suddenly in London, and spread with such rapidity that one city physician visited 107 patients in one day. The symptoms were peculiar in their severity—a great cough, violent sneezing, and coryza, the latter "excoriating the upper lip and vellicating the membrana sneideriana, rendering the inside of the nose extremely painful." A soreness over the eyes was complained of "chiefly about the brows, which they [the patients] said was seated in the bone, and rendered them stiff and painful to be opened" and susceptible to light. There were the usual diffused pains all over the body, but not much temperature, which in those days had to be judged from cutaneous sensation, with deductions from the pulse-rate. A traveller leaving London early in the morning observed "many of those who cry things for sale, to lean their heads against the walls of the houses, and cry their goods; not being able to support themselves upright." Coalmen and certain costers are still seen to put a hand to the side of the face when uttering their bellow. This may be a ritual reminder of the old epidemics when people leant their heads against walls before shouting, or it may be done to deaden the noise to the shouter, or, again, it may be intended to direct a shout.

The influenza was still somewhat of a novelty in 1782. In one of Samuel Foote's comedies of date 1770 it is referred to as "the new influenza," though in 1762 Mrs. Montagu refers to it as the "fashionable cold." The 1782 influenza was one of 11 severe epidemics which raged in England from 1693–1790. In the nineteenth century there were six great epidemics up to 1874, but the greatest series occurred in 1789–92, when the death-rate in London was alarming. In 1782 Hamilton notes that few died, though all patients suffered from intense weakness. The Parisians laughed at the unpleasant scourge at that time, nicknaming it the "petit poste" and "petit courier."

## SHREDDED SUET AND GROUND RICE.

AT Stoke-on-Trent on Jan. 28th, before the Potteries Stipendiary Magistrate, an important test-case was heard, when two grocers were summoned for selling shredded beef suet adulterated with ground rice. The prosecution stated that the shredded suet was made in Manchester and samples purchased at one of the shops had been found to contain 21·9 per cent. of ground rice, and those bought at the other 19·8 per cent. It was submitted that a proper standard was 15 per cent. For the defendants it was claimed that about 19 per cent. was a fair standard. The magistrate, who reserved his decision, said there was no question of fraud, of deceiving the customer, or of concealing inferior ingredients. It was purely a question of what was an excessive quantity of rice, a certain amount being necessary to separate the suet.

## GENIUS AND DISEASE.

THE publisher's note to Dr. A. C. Jacobson's[1] attempt to appraise for popular information the influence of disease upon artistic performance, is that we have here "a sane and balanced close-up of the men of genius, whose lives and work have been affected by drugs, drink, and disease." The little book may be a "close-up"—we do not take the publisher's analogy; but it is not sane, for the deductions are not based in a healthy way upon logical evidence; and it is not balanced, for the quality (whatever it may be) that is implied by the term "genius" is credited in no proper proportion to the victims of the "close-up." The author's thesis appears to be that men of genius require disease, drugs, or alcohol to set free the creative powers which are resident in their secondary personalities; and as witnesses to the power of alcohol he cites 76 names. Are we to agree that all these are people of genius on any balanced view? And is it a sane conclusion from the enumeration that Æschylus, Caracci (which?), Handel, Kingsley (which?), Stephen Collins Foster, and Richard Le Gallienne owe their respective fames—and these are hardly of comparable quality—to the use of alcohol? Are we to believe, because Horace praised Falernian wine, and Brouwer depicted revelling boors, and Sheridan urged the company to "let the toast pass," and certain of Dickens's immortal creations indulged in convivial drinking, that these undoubted men of genius consumed alcohol in any unusual manner, or did their best work only under its influence? Did Omar pass his off-time sitting under a tree with a jug? If Dr. Jacobson should reply that no such questions arise fairly out of his book, he has failed in the trade of an author by not making clear what he is writing about. The same reflection is induced by perusal of subsequent chapters. Dr. Jacobson cannot have had time to acquire personal acquaintance with the work of those whose names he cites with complacent profusion—no one could possess such encyclopædic knowledge. Nor has he found time to inquire into the validity or significance of the biographical details relied upon for the distribution of sinister stigmata. The publisher acclaims the work as "scientific in its content," but a less scientific approach to an important subject could hardly be imagined.

[1] Genius: Some Revaluations. By Arthur C. Jacobson. New York: Greenberg and Co. 1927. $2.50.

## A DEFINITION OF DRUNKENNESS IN THE NAVY.

WE learn from the current issue of the *Journal of the Naval Medical Service* the proper meaning to be attributed to the word "drunk" in naval practice. The Admiralty has laid down that a charge of drunkenness to be supported by evidence "that, through the intoxicating effect of liquor, the accused was unfit to be entrusted with his duty." The responsibility of the primary decision rests with the accused's commanding officer, but if there is any doubt about the reason the medical officer's opinion should be obtained at once, lest, a plea of sickness being brought forward at the court-martial, a guilty person may escape due punishment. The medical officer, if called in, may be required to give his opinion of the accused's fitness for duty, and must determine whether his condition can be accounted for wholly or in part by disease or injury. Therefore he should perform a complete and comprehensive examination at once, whether the accused complains of any disability or not. He should take complete notes at the time and try to form, from observed facts, an opinion whether accused's condition and behaviour are normal or abnormal, and whether he is fit to do duty; if his conduct and behaviour are abnormal, whether this is due to consumption of alcohol or to disease or injury, and in what proportions. These opinions will be stated in the medical officer's summary of evidence, if a court-martial should follow.

## A NEW EDITION OF LEE'S "MICROTOMIST'S VADE-MECUM."

*To the Editor of* THE LANCET.

SIR,—In conjunction with Dr. E. V. Cowdry, of the Rockefeller Institute, N.Y., I am editing the ninth edition of this book which it is proposed to bring out shortly. In addition to general technique the book will contain articles by experts on neurological technique, protozoa, histological applications of measurements of acidity and oxidation, microdissection, cultivation of tissues in vitro, fats, bone and teeth, and cytological technique. The purpose of this letter is to invite research workers and others to forward to me, as soon as possible, any new information which they may be glad to have incorporated in the book. It is not proposed to include bacteriological technique.

I am, Sir, yours faithfully,

J. BRONTË GATENBY.

Zoological Department, Trinity College, Dublin,
Feb. 4th, 1927.

## OVERFEEDING IN PREPARATORY SCHOOLS.

*To the Editor of* THE LANCET.

SIR,—I have had a letter from a correspondent who asks "Can anything be done about the overfeeding, and especially over-starchy feeding, in first-class preparatory schools? I went lately to see a small cousin at such a school. There the boys have six meals a day, the three intermediate meals consisting of milk and biscuits, rock cakes, bread and butter, and buns. The headmaster's wife assured me that 'the boys have no time to be hungry.' This school can be no exception, for when we ask a young nephew at another what he has to eat his reply is punctuated at intervals with 'And then we have cocoa and biscuits.' Fruit, with the exception of bananas, appears to be rare. The diet mentioned at the first school was, of course, in addition to 'tuck' three times a week. A good many of the errors come, I believe, from ignorance and not from pig-headedness."

These observations accord generally with my own, which are the result of frequent contact with schools of all kinds. My committee will be glad to advise heads and housekeepers of schools on suitable dietaries.

I am, Sir, yours faithfully,

CHARLES E. HECHT,
Hon. Sec., Schools Committee, Food Education Society.
Tufton-street, S.W., Feb. 4th, 1927.